SERVICE MANUAL SD720/SD820dbx

marantz®

model SD720/SD820dbx

Stereo Cassette Deck

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ Company has created the ultimate in stereo sound. Only original MARANTZ parts can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ stereo are generally available within 72 hours throughout the nation via a toll-free line to our National Parts Depot in California. The sales professionals who take your call immediately refer to their own desk top computer terminal and can quickly determine the availability and price information you require. If, for some reason, your order should exceed our available stock, we usually can instantly provide an alternate replacement part or current delivery information. When the order is placed and confirmed, the computer simultaneously generates "hard copy" orders at the distribution center. As hard copies come directly from the computer to the national parts depot, your requested stock is assembled and prepared for shipment and placed on the first available carrier for delivery to you.

ORDERING PARTS

Phone orders will eliminate mail delays, and we encourage the use of this method. If you order by mail, use MARANTZ parts order forms which are available from our National Parts Depot located at the following address:

SUPERSCOPE NATIONAL PARTS DEPARTMENT
20525 Nordhoff Street
Chatsworth, California 91311
Phone: 1-800-423-5108
1-213-998-9333

The following information must be supplied to eliminate delays in processing your order:

1. Complete address.
2. Complete part numbers.
3. Complete description of parts.
4. Model number for which part is required (indicate MARANTZ).
5. Account number (for account customers only).

Direct consumers will be provided with the current retail price quotation on available parts in order to advise them of the cost of the parts and shipping.

OVERSEAS PARTS ORDERING

Parts may also be ordered from the following overseas addresses:

U.S.A.
Marantz Company, Inc.
National Service Dept.
P.O. Box 577
Chatsworth, CA 91311
U.S.A.

CANADA
Superscope Canada, Ltd.
3710 Nashua Drive
Mississauga
Ontario, Canada L4V1M5

AUSTRALIA
Marantz Australia
32 Cross Street
Brookvale, NSW 2100
Australia

JAPAN
Marantz Japan, Inc.
3622 Kamitsuruma
Sagamihara-shi
Kanagawa, Japan

EUROPE

Marantz Europe S.A.
326 Avenue Louise Bte 32
1050 Brussels
Belgium

Marantz France
4 rue Bernard Palissy
92600 Asnieres
France

Marantz Audio U.K., Ltd.
193 London Road
Staines, Middlesex
United Kingdom

Marantz Germany GMBH
Max-Planck-Strasse 22
6072 Dreieich
West Germany

Marantz Belgium
45 rue Auguste Van Zande
1080 Brussels
Belgium

Marantz Svenska A.B.
Svartviksvägen 56
Traneberg
Box 12016
161 12 Bromma
Sweden

Marantz Norske A.S.
Refstadalleen 13
Oslo 5
Norway

Marantz Denmark
Bregnerødvej 132b
3460BIRKERØD
DENMARK

Marantz GMBH Austria
Wiedner Hauptstrasse 98
1050 WIEN
AUSTRIA

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please contact the nearest facility for the necessary assistance.

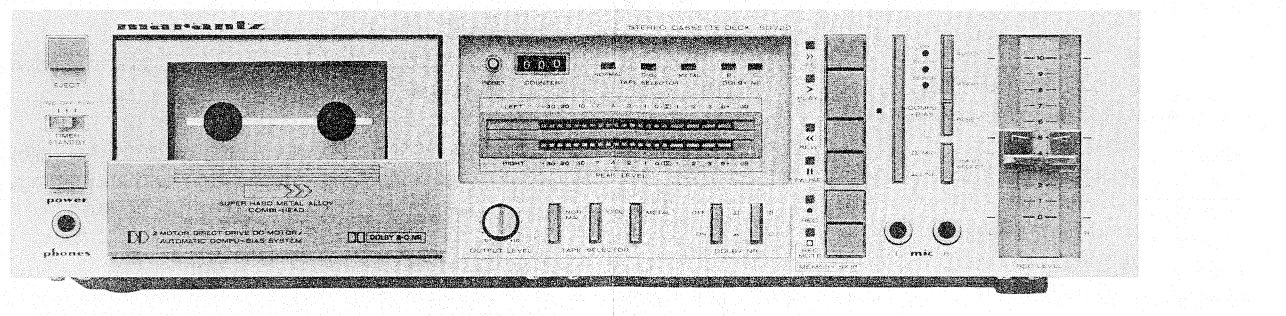
marantz®

TABLE OF CONTENTS

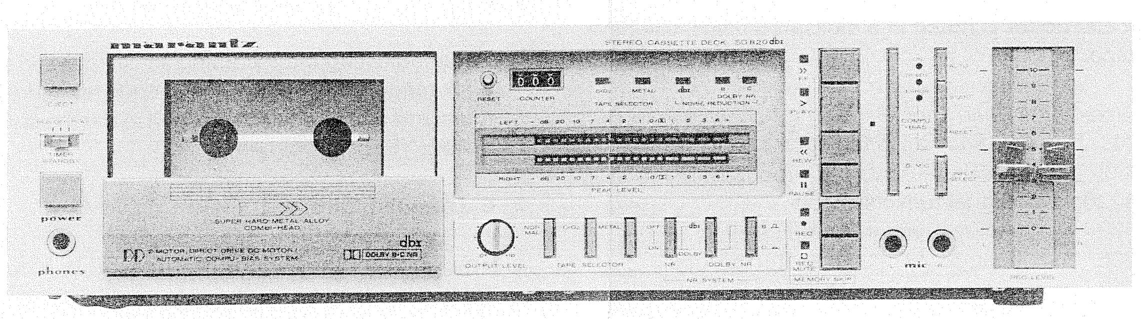
Section Title Page

1. SHOCK, FIRE HAZARD SERVICE TEST: 3
2. P.W. BOARD 3
3. TEST EQUIPMENT REQUIRED FOR SERVICING 4
4. SD720/SD820dbx COMPU-BIAS SYSTEM 4
    - 4.1 Features 4
    - 4.2 Operation Description 4
    - 4.3 Compu-Bias 7
    - 4.4 Test Items of Compu-Bias 7
    - 4.5 Operation of Compu-Bias Microprocessor (QQ01) 11
    - 4.6 Progress of Test and Indicator 13
    - 4.7 Operation of Circuits 13
    - 4.8 Memory and Data 17
5. DESCRIPTIONS OF MECHANISM AND CIRCUT OPERATIONS 17
    - 5.1 Initial Check 17
    - 5.2 IC Operation Circuit 17
    - 5.3 FF/REW Operations 17
    - 5.4 Play Operation 17
    - 5.5 Stop Operation 18
    - 5.6 Rec Operation 18
    - 5.7 Pause Operation 18
    - 5.8 Skip Circuit 18
    - 5.9 Muting 19
    - 5.10 Checking Voltage Output at Pin of QU01 21
    - 5.11 Operating Principles of the SD820dbx System 23
6. DISASSEMBLY 26
    - 6.1 Removing the Top Cover 26
    - 6.2 Removing the Front Panel 26
    - 6.3 Removing the Mechanism 26
    - 6.4 Removing the P.W. Board 26
7. MECHANICAL ADJUSTMENTS 27
    - 7.1 F/R Motor Pulley Position 27
    - 7.2 Adjustment of the Head Position During CUE/REC 27
    - 7.3 Play Take-Up Torque 27
8. ELECTRICAL ADJUSTMENTS 28
    - 8.1 Head Azimuth Adjustment 28
    - 8.2 Tape Speed Adjustment 29
    - 8.3 Playback Output Level Adjustment 29
    - 8.4 Playback Equalizer Adjustment 30
    - 8.5 Level Peak Level Meter Adjustment 30
    - 8.6 Adjustment of Compu-Bias (SD720/SD820dbx) 30
    - 8.7 Mpx Filter Adjustment 32
9. VOLTAGE CONVERSION 33
10. DIAGRAMS 34
    - 10.1 Level Diagrams 34
    - 10.2 Block Diagrams 35
    - 10.3 Wiring Diagrams 36
11. EXPLODED VIEWS AND PARTS LIST 42
    - 11.1 [C01-99] Front Panel 42
    - 11.2 [C02-99] Lid (Top and Bottom Cover) 43
    - 11.3 [C03-99] Rear Panel 44
    - 11.4 [P01-99] Front Chassis 45
    - 11.5 [P02-99] Associated Mechanism for Cassette Tape Operation 46
    - 11.6 [P03-99] Parts Assembled on Top of Chassis 47
    - 11.7 [P04-99] Parts Assembled on Reverse of Chassis 48
    - 11.8 [H01-99] Packing Materials 49
    - 11.9 Electrical Parts List 50
12. TECHNICAL SPECIFICATIONS 62

MARANTZ MODEL SD720 CASSETTE DECK



MARANTZ MODEL SD820dbx CASSETTE DECK



INTRODUCTION

This service manual are prepared for use by Authorized Warranty Station and contains service information for Marantz Stereo Cassette Deck.

Servicing information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instructions should be read carefully. No attempt should be made to proceed without a good understanding of the operation of the Cassette Deck.

The parts list furnishes information by which replacement parts may be ordered from the Marantz Company. A simple description is included for parts which can be usually obtained through local suppliers.

1. SHOCK, FIRE HAZARD SERVICE TEST:

CAUTION: After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verfied before return to user/customer.

Ref. UL Standard NO. 1270. Para. 66. 3. D (Mandatory Test after servicing Electrical Appliances, effective 7-1-83).

2. P.W. BOARDS

As can be seen from the circuit diagram, the chassis of your Cassette Deck consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

1. Dolby B/C NR .... mounted on P.W. Board P601
2. Power Supply .... mounted on P.W. Board P801
3. DBX .... mounted on P.W. Board P901 (SD820 dbx only)
4. Rec Volume .... mounted on P.W. Board PE01
5. Main Amp .... mounted on P.W. Board PJ01
6. Head Phone .... mounted on P.W. Board PJ02
7. Auto Bias and EQ .... mounted on P.W. Board PQ01
8. Auto Indicator .... mounted on P.W. Board PQ02
9. Auto Sub .... mounted on P.W. Board PQ03
10. Timer Switch .... mounted on P.W. Board PU01
11. Key Switch .... mounted on P.W. Board PY01
12. Indicator .... mounted on P.W. Board PY02

3. TEST EQUIPMENT REQUIRED FOR SERVCING

For measuring or checking your Cassette Deck, the following instrkuments and materials are necessary.

- VTVM
- Audio Oscillator (AF OSC)
- Attenuator (600 Ω)
- Oscilloscope
- Bandpass Filter (1 kHz)
- IEC A-Curve Filter
- Wow and Flutter Meter
- Torque Meter (Cassette Type)
- Digital Frequency Counter
- Distortion Meter
- Blank Tapes (Completely erased with bulk eraser)
  TDK AC-212 (Normal)
  TDK AC-512 (Special/CrO2)
  TDK AC-711 (Metal)

NOTE: If any doubt is noted in a measured value, use new tape.

• Test Tapes	(New Tape)
MTT-111	Wow and Flutter, Tape Speed
MTT-112	Measurements of Output Level
MTT-112B	Signal-to-Noise Ratio
MTT-150	Adjustment of Output Level
MTT-256	Frequency Response (for Normal)
MTT-356	Frequency Response (for Special/ CrOs, Fe-C2 and Metal)
MTT-121	Cross Talk
MTT-141	Channel Separation

4. SD720/SD820 dbx COMPU-BIAS SYSTEM

4.1 FEATURES

1. Fine setting with microprocessor

a. Each item is adjusted in 25dB steps, allowing for fine settings.

b. The recording bias current, recording sensitivity, middle range recording equalization and high range recording equalization are adjusted to the best point.

2. Performance oriented design

a. The recording bias is determined not with frequency response, but peak bias at 1kHz. If the recording bias is determined with the frequency response, distortion increases and MOL (Maximum Output Level) decreases. With the peak bias at 1kHz, the best point between the frequency response and distortion can be found.

b. When adjusting the recording sensitivity and middle and high range equalization, the output level does not fluctuate and a flat frequency response can be obtained, producing the best Dolby NR effect.

3. 6 data memories

a. The tape selector settings (Normal, CrO2, Metal)—factory set using reference tapes — are maintained with a built-in lithium battery even when the power switch is turned OFF.

b. The auto memory contents obtained by the auto setting operation are also backed up and recalled by simply pressing the AUTO key.

4. Perfect error treatment

There are two performance check points in each setting procedure to perform fine setting. If an error is detected at the check point, the setting procedure returns to the first recording bias setting. If the error occurs again, the unit returns to the beginning of the auto start setting, ERROR is indicated for 15 seconds, the unit is reset and the fixed memory contents which were factory set using reference tapes are recalled. These procedures are automatically carried out by the microprocessor. If recording equalization which tends to fluctuate at 15kHz cannot be compensated, the recording equalization is set to the nearest point, to prevent unnecessary error.

4.2. OPERATION DESCRIPTION

1. Adjustment start

a. When the AUTO key is depressed, the unit detects whether the recording lock-out tab in the cassette is removed or not. If the recording lock-out tab is removed, the AUTO key does not function. When the recording lock-out tab is not removed, the ON LED lights up and data memory is changed to auto memory.

b. When the START key is depressed, the unit enters the recording mode and the starting point is memorised. The AUTO ON LED starts flickering to indicate that the auto setting procedure has been started.

c. At the same time as the auto setting procedure starts, the audio mute signal is output and all the adjusting signals are muted. The rec mute circuit is also controlled.

d. During auto setting operation, the mechanism control microprocessor is controlled and the mechanism keys cannot be operated. To release the auto setting operation, press RESET key. The tape is rewound and the unit stops at the auto setting operation start position. The contents of the fixed memory are recalled.

e. The rec input is changed from the mic/line to built-in audio oscillator and a signal of 1kHz is input. The frequency response control level and theDⵎ level at 1kHz, 7kHz and 15kHz are set to −20dB.

f. The recording/playback output level with 1kHz input signal is detected and the unit detects that the tape is not a leader tape. If the leader tape is detected, the unit continues to record for 10 seconds to find a magnetic tape. If the magnetic tape cannot be detected and the reel pulse (take up reel: 4 pulse/rotation) stops, the unit senses that the tape has reached its end, the ERROR is indicated and unit stops.

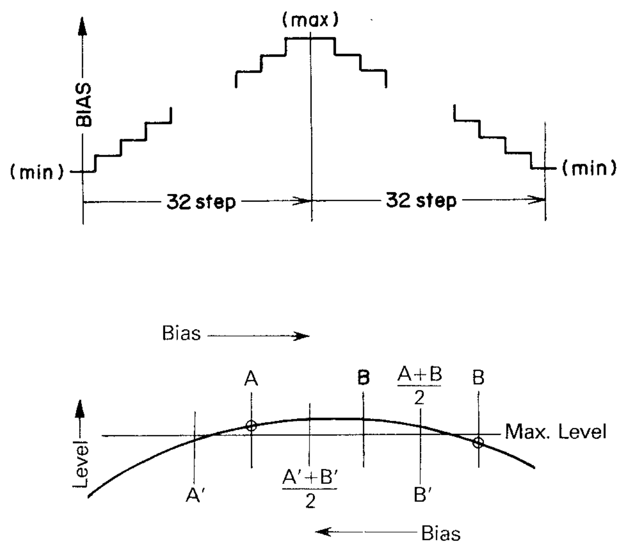
g. The ERROR indicator lights for 15 seconds and stops and the unit enters the RESET mode. The contents of the fixed memory are recalled. In this case, the tape is not rewound.

h. With the 1kHz signal detection, the recording bias, recording sensitivity and recording equalization are not adjusted. They are set to the center points and recording is carried out. Therefore, the evaluation level has some range.

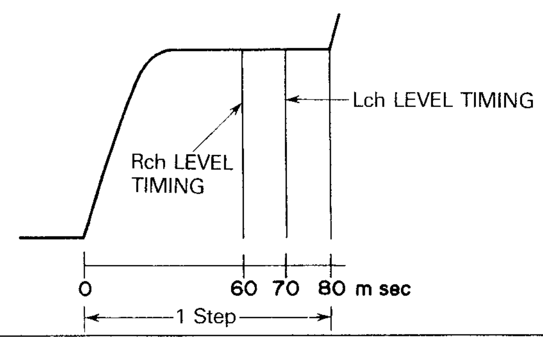
2. Bias adjustment

a. With the 1kHz signal, the peak bias setting is carried out. If the bias is adjusted with the frequency response, a distortion will occur and the best MOL cannot be obtained.

b. The test signal at 1kHz is divided into 32 steps (a total of 64 steps) with a range of ±60% from the average value of the recording bias current. Each step equals 80msec.



Real Peak Bias Point = 1/2 (A+B/ 2 + A'+B'/2)



c. At the same time as the recording bias is changed, the recording/playback output is observed and the maximum point (A) of the output level and 1 down point (B) after the maximum point are read and the mean value (A + B)/2 is obtained. This procedure is performed twice on both L and R channels and the two independent mean values are obtained.

d. Recording bias ERROR
If the peak point cannot be found at the first attempt (no down point after maximum level), the setting procedure is repeated again.
If the peak point cannot be found at the second attempt, ERROR is indicated.
- The ERROR indicator lights.
- The tape is rewound and stops at the auto setting start point.
- The ERROR indicator stops lighting after 15 seconds and the unit enters the rest mode. The auto ON indicator goes off. (The contents in the fixed memory are recalled.)

3. Recording sensitivity and recording equalization adjustment

a. After the recording bias is adjusted, the recording/playback sensitivity at 1kHz and recording equalization at 1kHz are compared with those at 7kHz and 15kHz. The reference level (Dⵎ level −20dB) is memorised in the microprocessor and recording compensation is carried out referring to this level. The reading is carries out as follows:
- The equalization at 1kHz, 7kHz and 15kHz is recorded with 16 step center values.
- The step reference between the recording/playback output level and reference signal is obtained.
- The recording compensation is changed according to the obtained value and the second recording is carried out.
- The difference is obtained between the reference signal and second signal.
- The recording compensation is changed according to the second obtained value and the third recording is carried out.
- The difference between the third obtained value and the reference signal is obtained and the final step value is memorised.

b. Adjustment
The L and R bias current setting differs and is carried out as follows:
The setting is carried out three times as 1 step 80msec at 1kHz, 7kHz and 15kHz.

① Lch	1KHz	1st	⑩ Rch	1KHz	1st
② Lch	7KHz	1st	⑪ Rch	7KHz	1st
③ Lch	15KHz	1st	⑫ Rch	15KHz	1st
④ Lch	1KHz	2nd	⑬ Rch	1KHz	2nd
⑤ Lch	7KHz	2nd	⑭ Rch	7KHz	2nd
⑥ Lch	15KHz	2nd	⑮ Rch	15KHz	2nd
⑦ Lch	1KHz	3rd	⑯ Rch	1KHz	3rd
⑧ Lch	7KHz	3rd	⑰ Rch	7KHz	3rd
⑨ Lch	15KHz	3rd	⑱ Rch	15KHz	3rd

c. Evaluation

The evaluation of each channel is carried out as follows:

(1kHz, 7kHz): The last memory step value other than at both edges is correct.

(15kHz): A final evaluation is not carried out. An approximate value is correct. This is why there is no large error after adjustment at 7kHz. The commercially available no-brand tapes tend to fluctuate at 15kHz. Then the ERROR indicator lights up and the fixed memory is recalled. With the auto setting procedure, the high frequency is increased to some extent and better recording may result.

d. ERROR indication

- When the last memory value at 1kHz and 7kHz is 0 or 31, the unit determines that this is an error and returns to the beginning of bias current adjustment.
- If the error occurs again, the ERROR indicator lights up again.
  (1) The ERROR indicator lights.
  (2) The tape is rewound and stops at the beginning of auto setting operation point.
  (3) The ERROR indicator stops lighting after 15 seconds and the unit enters reset mode. The auto ON indicator goes off. (The contents of the fixed memory are recalled.)

e. Final tape detection

- After setting the tape equalization, the tape is finally checked.
- When everything is OK, the READY indicator turns ON.
- The tape is automatically rewound and the unit searches the auto operation start point.
- A 4-second non-recorded section is provided from the auto setting start point and the unit enters rec pause mode.

4. Notes on auto bias and equalization setting

a. Start condition

To start the auto setting operation, the unit should be in the stop mode and the cassette can be recorded. If the auto setting operation does not start even when the auto START key is depressed, check the following.

(1) Immediately after the tape transport mechanism stops. (To change the priority order of mechanism and auto setting microprocessors, the auto setting microprocessor does not work for about 2 seconds.)
(2) Whether the mechanism is in the mode other than stop or pause.
(3) Whether the tape is not loaded correctly.
(4) Whether the recording lock-out tab of the cassette is removed.

b. Auto setting operation stop

During auto setting operation, the auto setting microprocessor has a priority over the mechanism microprocessor and none of tape transport keys can be operated. To stop the auto setting operation, depress the RESET key. The unit returns to the auto setting start point and stops. If the tape selector switch is operated during auto setting operation, the unit detects an error, returns to the auto setting start point and stops. Carry out the auto setting with the tape selector switch set correctly.

c. When error occurs

If an error occurs, check the following again:

(1) Whether tape selector switch is set correctly.
(2) Whether the tape is in the head position.
(3) Whether the tape is very low grade or old. The auto setting operation sometimes cannot be carried out at the beginning or end of the tape. Carry out the auto setting in the tape inside as possible.

d. Ready

When the auto setting is completed, the tape is automatically rewound to the auto setting start point, the READY indicator lights up, a 4-second non-recorded section is provided and the unit enters rec pause mode. When the READY indicator lights up, the auto setting is completed and the tape transport keys can be operated.

5. Data memory

Three kinds of recording bias, recording sensitivity and recording equalization obtained from auto setting procedure are memorised according to the tape selector switch settings and backed by the built-in lithium battery even when the power switch is turned off. The stored data can be recalled as follows.

(1) The factory set data using reference tapes is recalled when the power switch is turned on.
(2) The data obtained from the auto setting operation is memorised in the auto memory. Each time the auto setting operation is carried out, the data in the auto memory is renewed.
(3) When the power switch is turned on and AUTO key is depressed, the auto ON LED lights up and the data in the auto memory is recalled. In this condition, recording with auto memory data is possible.
(4) To recall the fixed memory data, depress RESET key.

4.3 COMPU-BIAS

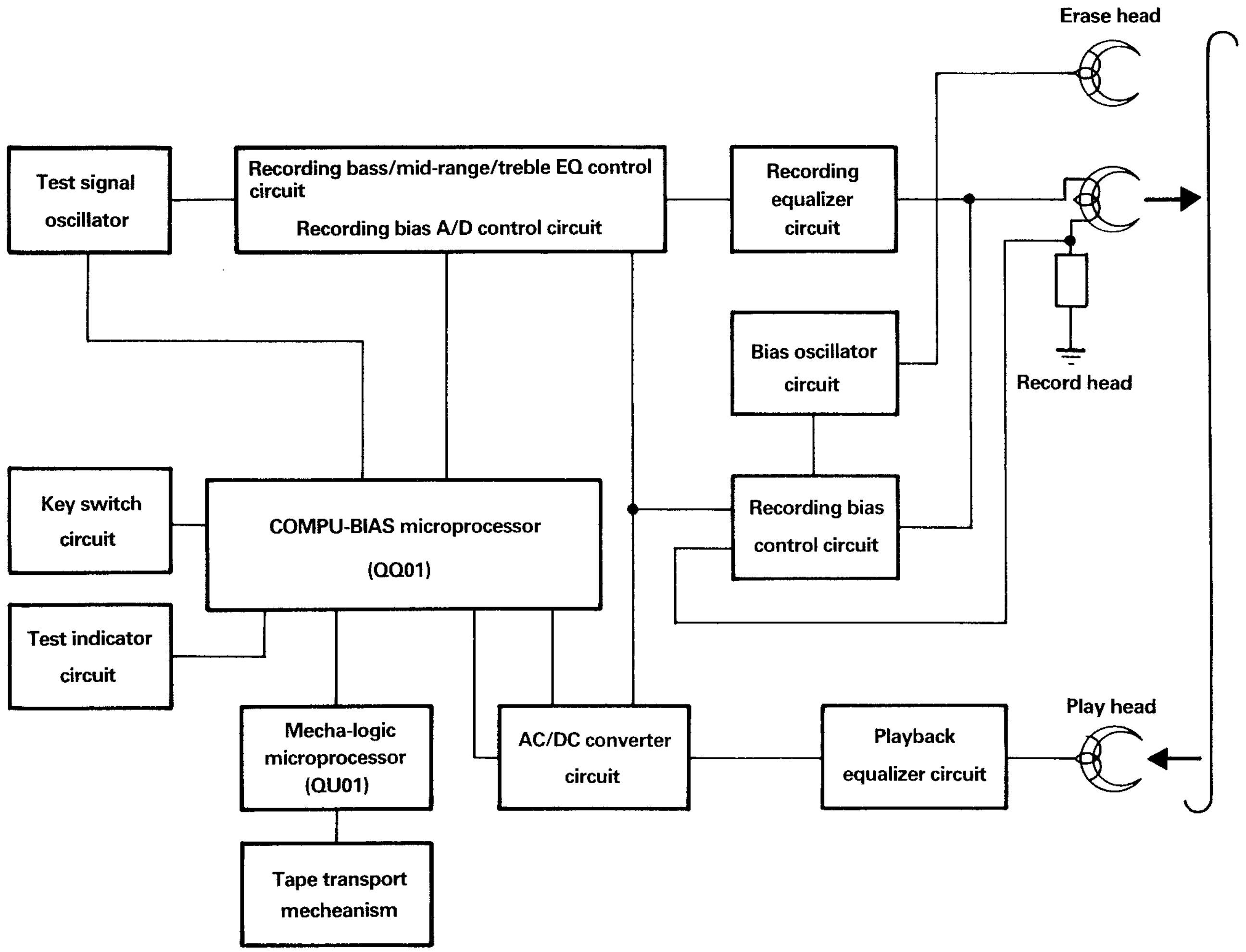

Erase head
Test signal oscillator
Recording bass/mid-range/treble EQ control circuit
Recording bias A/D control circuit
Recording equalizer circuit
Bias oscillator circuit
Record head
Key switch circuit
COMPU-BIAS microprocessor (QQ01)
Recording bias control circuit
Test indicator circuit
Play head
Mecha-logic microprocessor (QU01)
AC/DC converter circuit
Playback equalizer circuit
Tape transport mecheanism

Figure 1

Figure 1 is a schematic diagram of the COMPU-BIAS and Figure 5 a block diagram.
When test starts, the COMPU-BIAS microprocessor controls the "mecha-logic control" microprocessor (QU01) and puts it in record mode. It controls operation of the test signal oscillator and its output frequency and provides the recording bass/mid-range/treble equalizers (QK01 and 02) and the recording bias circuit with control data to perform recording and playback it detects the current playback level and works out optimum recording bias control data and optimum recording equalizer data. When test completes, the tape is rewound back to the location where test started and the "mecha-logic control" microprocessor is controlled to perform AUTO REC MUTE.

4.4 TEST ITEMS OF COMPU-BIAS

The test items are listed in Table 1. Figure 2 shows timing diagrams and Figure 4 a flowchart of the tests.

Table 1

	Test signal frequency
1. Magnetic tape sensing test	1kHz
2. Level coarseadjust	1kHz
3. UP-direction recording bias test	1kHz
4. DOWN-direction recording bias test	1kHz
5. L-channel bass EQ test	1kHz
6. L-channel mid-range EQ test	7kHz
7. L-channel treble EQ test	15kHz
8. L-channel bass EQ test	1kHz
9. L-channel mid-range EQ test	7kHz
10. L-channel treble EQ test	15kHz
11. L-channel bass EQ test	1kHz
12. L-channel mid-range EQ test	7kHz
13. L-channel treble EQ test	15kHz
14. R-channel bass EQ test	1kHz
15. R-channel mid-range EQ test	7kHz
16. R-channel treble EQ test	15kHz
17. R-channel bass EQ test	1kHz
18. R-channel mid-range EQ test	7kHz
19. R-channel treble EQ test	15kHz
20. R-channel bass EQ test	1kHz
21. R-channel mid-range EQ test	7kHz
22. R-channel treble EQ test	15kHz
23. Magnetic tape sensing test	1kHz

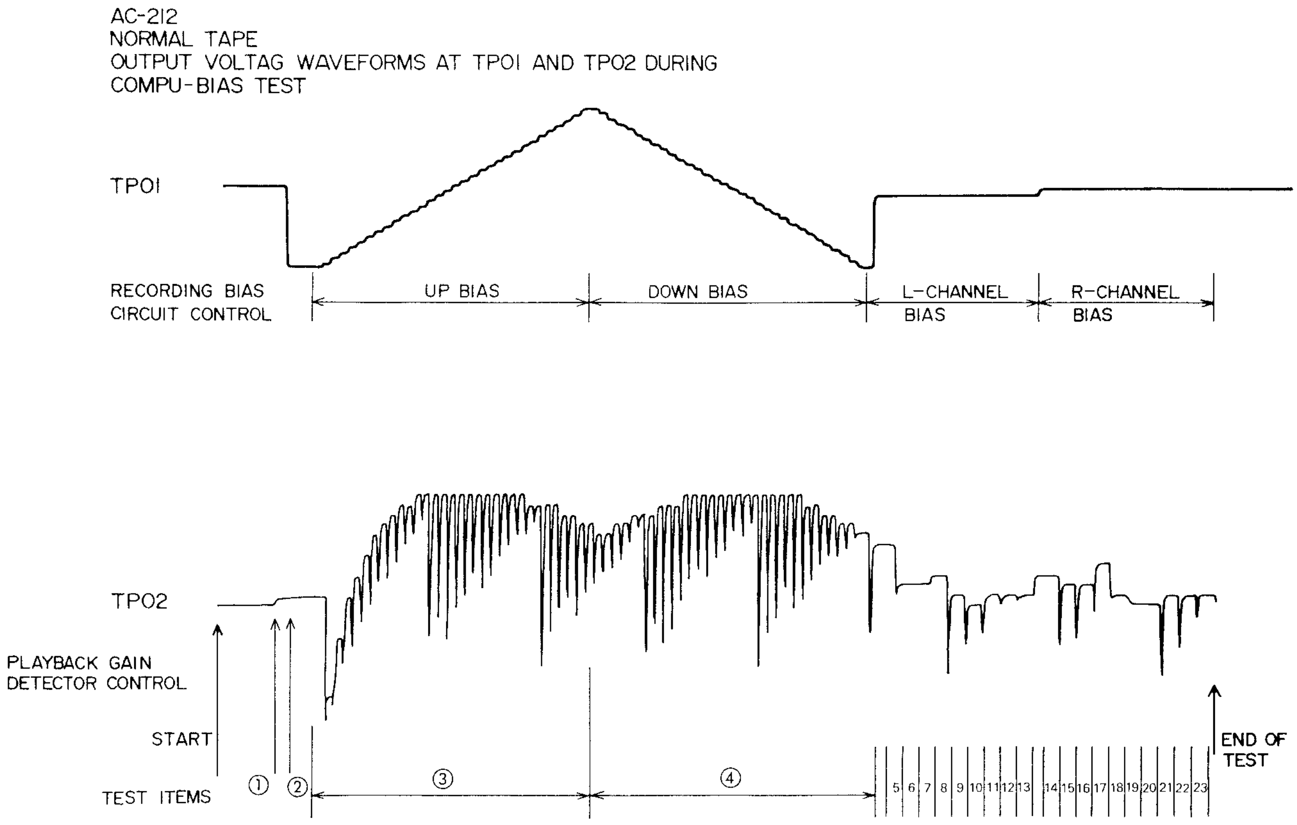


Figure 2

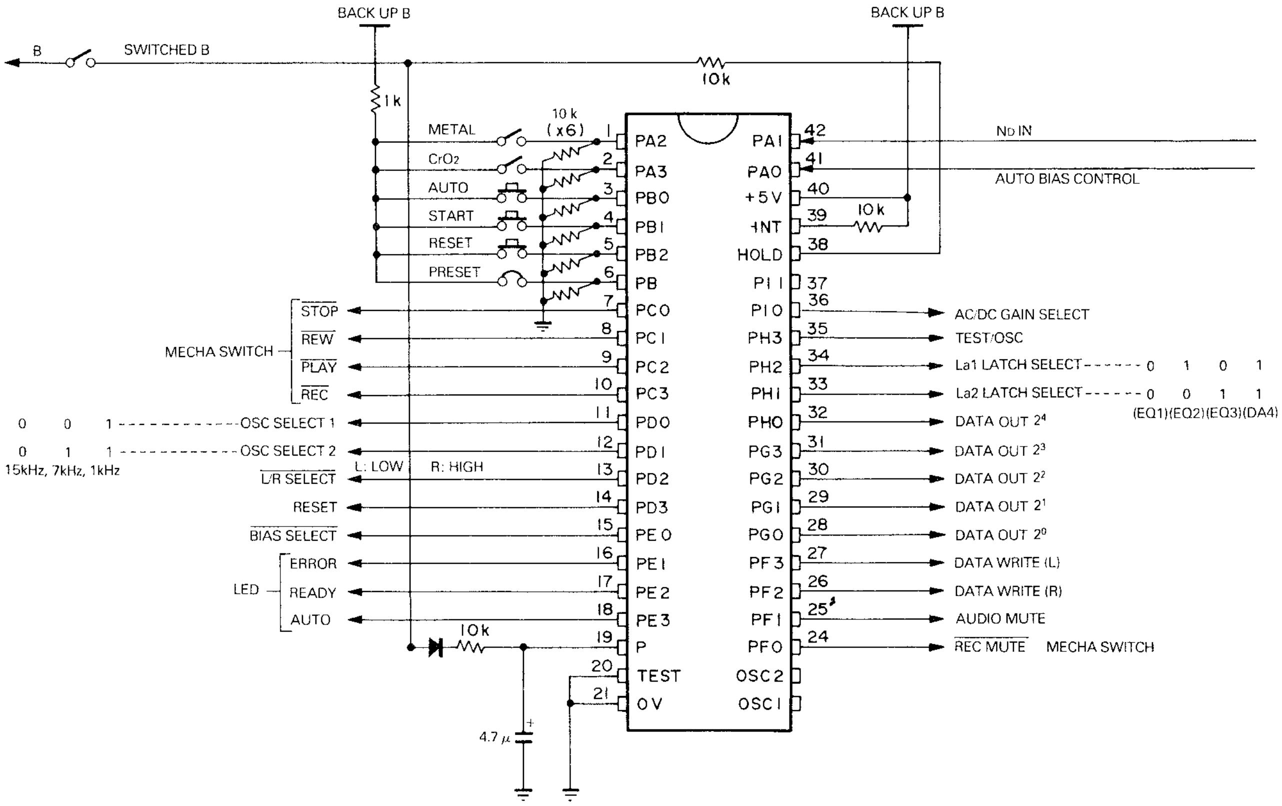

BACK UP B
BACK UP B
B
SWITCHED B
10k
1k
10 k
(x6)
METAL
CrO2
AUTO
START
RESET
PRESET
MECHA SWITCH
STOP
REW
PLAY
REC
0 0 1 OSC SELECT 1
0 1 1 OSC SELECT 2
15kHz, 7kHz, 1kHz
L/R SELECT
L: LOW
R: HIGH
RESET
BIAS SELECT
LED
ERROR
READY
AUTO
10k
4.7 µ
1 PA2
2 PA3
3 PB0
4 PB1
5 PB2
6 PB
7 PC0
8 PC1
9 PC2
10 PC3
11 PD0
12 PD1
13 PD2
14 PD3
15 PE0
16 PE1
17 PE2
18 PE3
19 P
20 TEST
21 0V
42 PA1
41 PA0
40 +5V
39 INT
38 HOLD
37 PI1
36 PI0
35 PH3
34 PH2
33 PH1
32 PH0
31 PG3
30 PG2
29 PG1
28 PG0
27 PF3
26 PF2
25 PF1
24 PF0
OSC2
OSC1
10k
ND IN
AUTO BIAS CONTROL
AC/DC GAIN SELECT
TEST/OSC
La1 LATCH SELECT 0 1 0 1
La2 LATCH SELECT 0 0 1 1
(EQ1)(EQ2)(EQ3)(DA4)
DATA OUT 2⁴
DATA OUT 2³
DATA OUT 2²
DATA OUT 2¹
DATA OUT 2⁰
DATA WRITE (L)
DATA WRITE (R)
AUDIO MUTE
REC MUTE
MECHA SWITCH

Figure 3

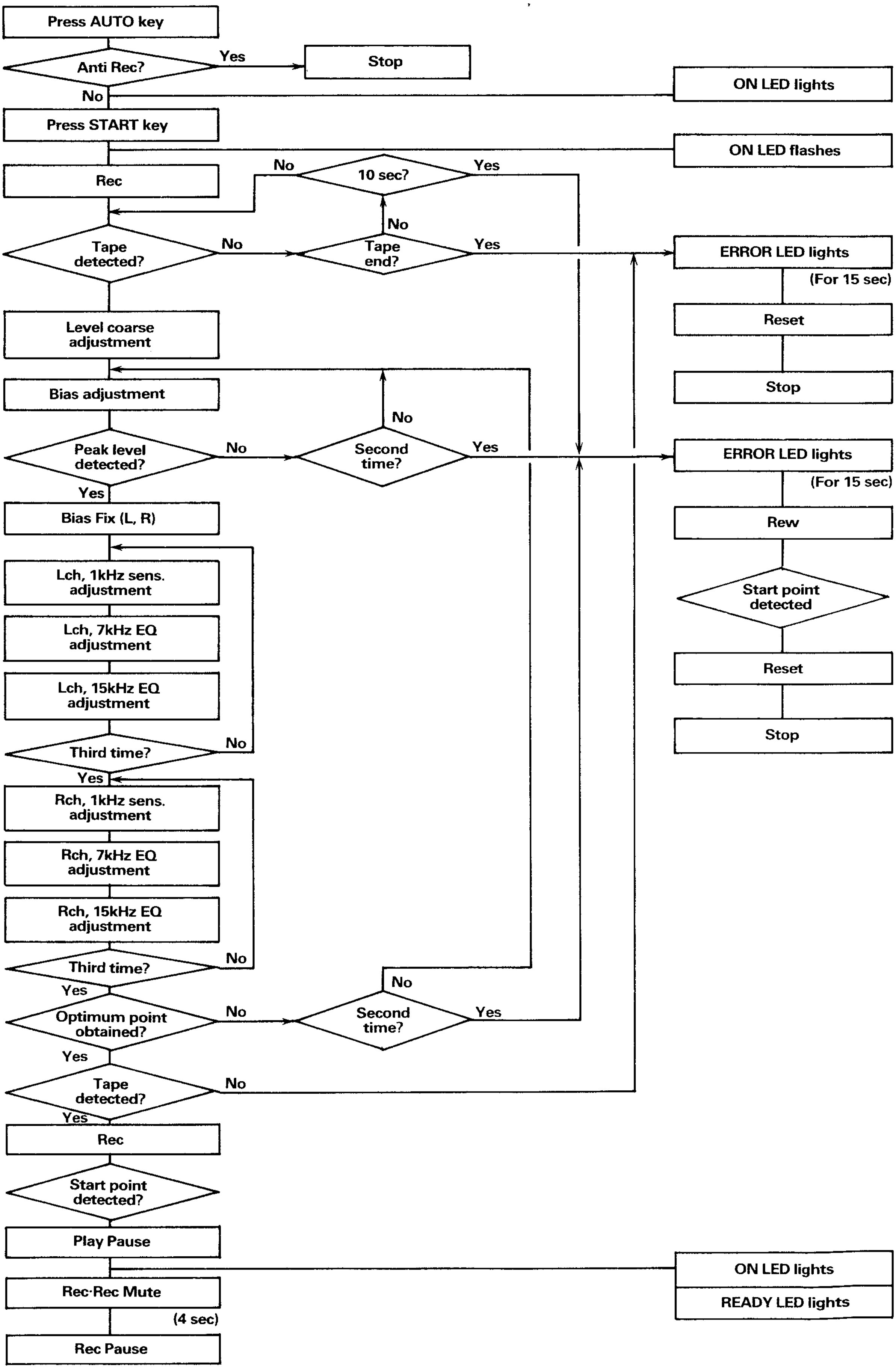

Press AUTO key
Anti Rec?
Yes
Stop
No
ON LED lights
Press START key
ON LED flashes
Rec
No
10 sec?
Yes
No
Tape detected?
No
Tape end?
Yes
ERROR LED lights
(For 15 sec)
Reset
Stop
Level coarse adjustment
Bias adjustment
No
Peak level detected?
No
Second time?
Yes
ERROR LED lights
(For 15 sec)
Yes
Bias Fix (L, R)
Rew
Lch, 1kHz sens. adjustment
Lch, 7kHz EQ adjustment
Start point detected
Lch, 15kHz EQ adjustment
Reset
Third time?
No
Stop
Yes
Rch, 1kHz sens. adjustment
Rch, 7kHz EQ adjustment
Rch, 15kHz EQ adjustment
Third time?
No
Yes
No
Optimum point obtained?
No
Second time?
Yes
Yes
Tape detected?
No
Yes
Rec
Start point detected?
Play Pause
ON LED lights
READY LED lights
Rec·Rec Mute
(4 sec)
Rec Pause

Figure 4

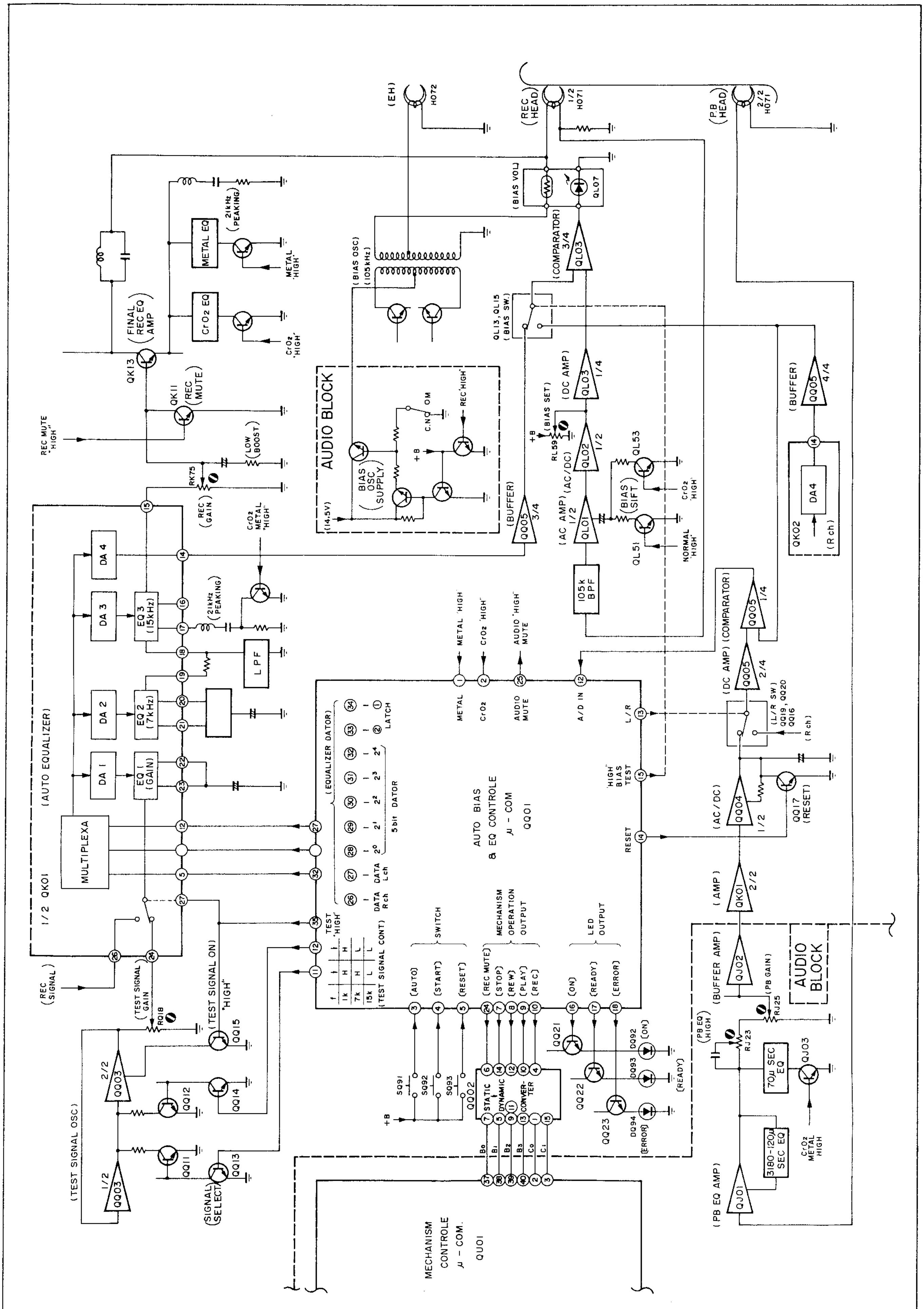

AUTO BIAS
& EQ CONTROLE
μ - COM
QQ01
MECHANISM
CONTROLE
μ - COM.
QU01
AUDIO BLOCK
BIAS OSC SUPPLY
(14.5V)
(BIAS OSC)
(105kHz)
(EH)
H072
(REC HEAD)
1/2 H071
(PB HEAD)
2/2 H071
(BIAS VOL)
QL07
(COMPARATOR) 3/4
QL03
QL13, QL15 (BIAS SW)
(DC AMP)
QL03 1/4
(BIAS SET)
RL59
(AC/DC)
QL02 1/2
(AC AMP) 1/2
QL01
(BIAS SIFT)
QL53
QL51
CrO2 'HIGH'
NORMAL 'HIGH'
105k BPF
(BUFFER)
QQ05 3/4
QQ05 4/4
QK02
DA4
(Rch)
(COMPARATOR)
QQ05 1/4
(DC AMP)
QQ05 2/4
(L/R SW) QQ19, QQ20 QQ16
(AC/DC)
QQ04 1/2
QQ17 (RESET)
(AMP)
QK01 2/2
(BUFFER AMP)
QJ02
(PB GAIN)
RJ25
(PB EQ HIGH)
RJ23
70μ SEC EQ
QJ03
3180-120μ SEC EQ
CrO2 METAL HIGH
(PB EQ AMP)
QJ01
FINAL REC EQ AMP
QK13
METAL EQ
CrO2 EQ
(2kHz PEAKING)
METAL 'HIGH'
CrO2 'HIGH'
QK11 (REC MUTE)
REC MUTE "HIGH"
(LOW BOOST)
RK75
(REC GAIN)
(AUTO EQUALIZER)
1/2 QK01
DA 1
DA 2
DA 3
DA 4
EQ 1 (GAIN)
EQ 2 (7kHz)
EQ 3 (15kHz)
LPF
MULTIPLEXA
CrO2 METAL 'HIGH'
(REC SIGNAL)
(TEST SIGNAL GAIN)
RQ18
(TEST SIGNAL ON) "HIGH"
QQ15
QQ03 2/2
QQ03 1/2
QQ12
QQ14
QQ11
QQ13
(SIGNAL SELECT)
(TEST SIGNAL OSC)
(EQUALIZER DATOR)
DATA Rch
DATA Lch
5 bit DATOR
LATCH
TEST 'HIGH'
(TEST SIGNAL CONT)
METAL
CrO2
AUDIO MUTE
A/D IN
L/R
'HIGH' BIAS TEST
RESET
METAL 'HIGH'
CrO2 'HIGH'
AUDIO 'HIGH' MUTE
SWITCH
(AUTO)
(START)
(RESET)
MECHANISM OPERATION OUTPUT
(REC MUTE)
(STOP)
(REW)
(PLAY)
(REC)
LED OUTPUT
(ON)
(READY)
(ERROR)
SQ91
SQ92
SQ93
+B
QQ02
STATIC DYNAMIC CONVERTER
B0
B1
B2
B3
C0
C1
QQ21
QQ22
QQ23
DQ92
DQ93
DQ94

Figure 5

4.5. OPERATION OF THE COMPU-BIAS MICROPROCESSOR (QQ01)

Inputs and outputs of the COMPU-BIAS microprocessor (QQ01) are shown in figure 3. Operation of the COMPU-BIAS microprocessor is described below accoring to the flowchart.

4.5.1. Initial state

Figure 6 shows the initial states of the QQ01's terminals.

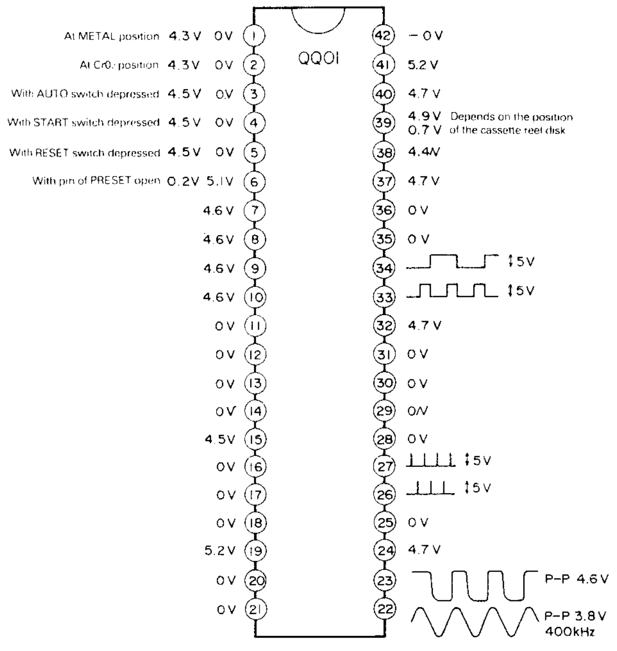

QQ01
At METAL position 4.3 V 0V ①
At CrO₂ position 4.3 V 0V ②
With AUTO switch depressed 4.5 V 0V ③
With START switch depressed 4.5 V 0V ④
With RESET switch depressed 4.5 V 0V ⑤
With pin of PRESET open 0.2V 5.1V ⑥
4.6 V ⑦
4.6V ⑧
4.6V ⑨
4.6V ⑩
0V ⑪
0V ⑫
0V ⑬
0V ⑭
4.5V ⑮
0V ⑯
0V ⑰
0V ⑱
5.2V ⑲
0V ⑳
0V ㉑
㊷ − 0 V
㊶ 5.2 V
㊵ 4.7 V
㊴ 4.9 V 0.7 V Depends on the position of the cassette reel disk
㊳ 4.4V
㊲ 4.7 V
㊱ 0 V
㉟ 0 V
㉞ ↕5V
㉝ ↕5V
㉜ 4.7 V
㉛ 0 V
㉚ 0 V
㉙ 0/V
㉘ 0 V
㉗ ↕5V
㉖ ↕5V
㉕ 0 V
㉔ 4.7 V
㉓ P–P 4.6 V
㉒ P–P 3.8 V 400kHz

Figure 6

4.5.2. Operation after depression of the auto switch

a. Pin ⑥ of microprocessor QQ01
FACTORY SET MEMORY DATA is, when pin PRESET is shorted, output and delivered to QK01 and QK02 (auto EQ ICs) and user SET MEMORY DATA when the pin is open.

b. When AUTO LED is lighting
QQ01 pin ⑱ Low → High

4.5.3. Operation after depression of the START switch

1. Operation immediately after depression of the START switch

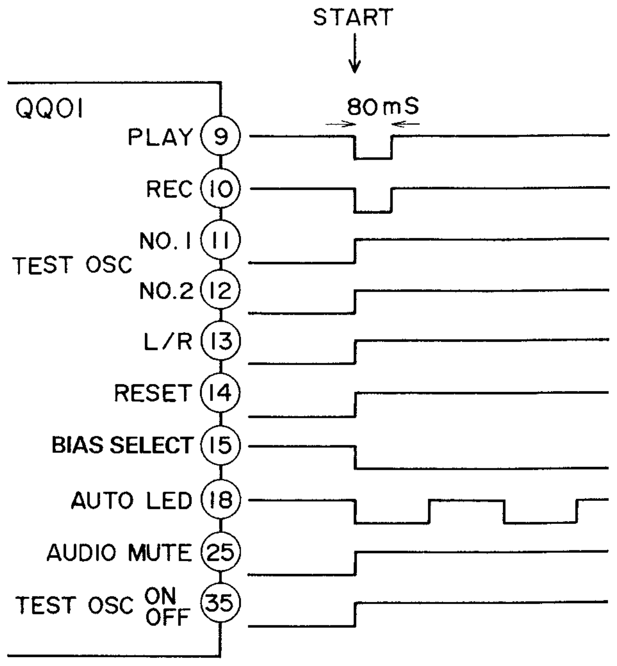

START
80mS
QQ01
PLAY ⑨
REC ⑩
TEST OSC
NO. 1 ⑪
NO.2 ⑫
L/R ⑬
RESET ⑭
BIAS SELECT ⑮
AUTO LED ⑱
AUDIO MUTE ㉕
TEST OSC ON OFF ㉟

Figure 7

a. High → Low output of microprocessor pins ⑨ and ⑩ gets subjected to QQ02 Statics → Matrix conversion and delivered to mechanism's microprocessor QU01 to put the device in REC mode.
b. The 5-bit data of pins ㉘ through ㉜ is fixed to "10000B". The control data of the bass/mid-range/treble recording equalizer and recording bias circuit are also fixed to a central value.
c. Pin ㉕ turns from Low to High to play-mute the audio system. The mechanism control keys are inhibited.
d. Pin ㉟ turns from Low to High to activate test signal oscillator QQ03 and set the signal selector of auto EQ ICs (QK01 and QK02) at the Test Signal side.
e. Pin ⑪ and ⑫ turn from Low to High to set the output frequency of QQ03 at 1kHz.
f. Pin ⑬ changes from Low (L channel) to High (R channel).
g. Pin ⑭ changes from Low to High to reset the device.
h. Pin ⑱ changes from High to Low to High repeatedly to let and LED blink.

2. MAG detection and level coarse adjustment
The presence of magnetic tape is check about one second after START, then level coarse adjustment is performed.

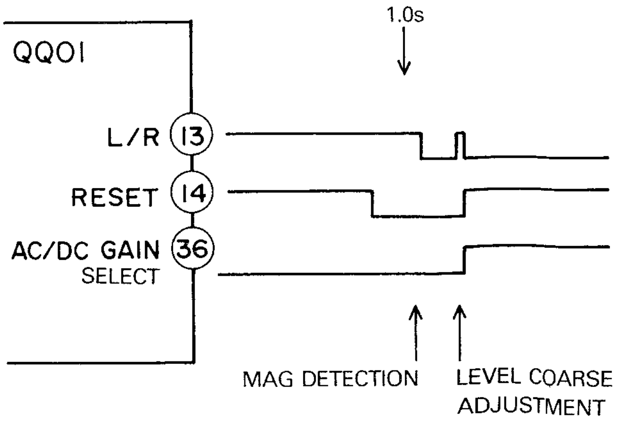

1.0s
QQ01
L/R ⑬
RESET ⑭
AC/DC GAIN ㊱
SELECT
MAG DETECTION
LEVEL COARSE ADJUSTMENT

Figure 8

In the detection of the presence of magnetic tape, an error results and the mechanism stops if magnetic tape does not come in approximately 10 seconds. The presence of magnetic tape is checked on the R channel.
After 70 msec after the detection of magnetic tape, level is checked in both the L and R channels at 1kHz and the value of EQ1 of AUTO EQ (QK01 and QK02) is corrected to reach a reference level. The level is detected by comparing the DC voltage generated by QK02 digital-to-analog conversion with the result of AC-to-DC conversion of the playback demodulator.

3. Detection of peak bias
   In approximately 0.4 second after level coarse adjustment, bias is raised gradually and, during this time, the peak playback level is memorized in QQ01 (1 step 80 msec). Level is checked at every step for both L and R to find a peak. When the bias has reached the upper limit, it then is lowered step by step to find a peak. And the average of the peak levels found during upward and downward searches is worked out. If no peak is found during a cycle of search, search will be made one more time. And an error result if no peak is found still.

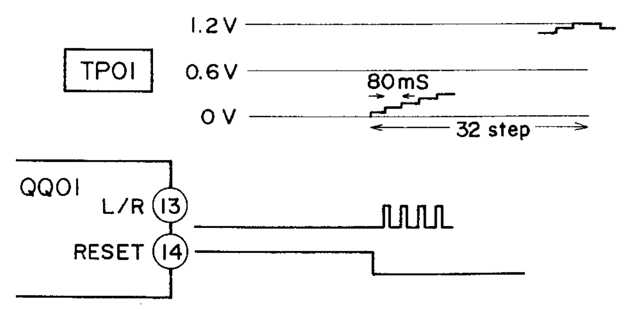

1.2V
TPOI
0.6V
80mS
0V
32 step
QQOI
L/R 13
RESET 14

Figure 9

4. Equalizer adjustment
   In approximately 6.5 seconds after START, peak bias detection ends and equalizer adjustment begins.

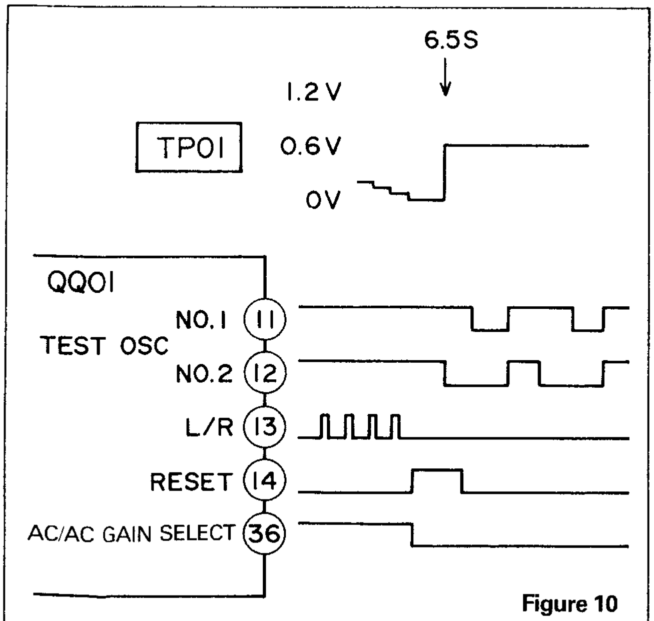

6.5S
1.2V
TPOI
0.6V
0V
QQOI
NO.1 11
TEST OSC
NO.2 12
L/R 13
RESET 14
AC/AC GAIN SELECT 36

Figure 10

The peak biases detected on the L and R channels are output from QK01 DA4 to perform equalizer adjustment. The R-channel equalizer is adjustment first and then the L-channel one.
Outputs of QQ01 pins ⑪ and ⑫ are switched to generate signals of 1kHz, 7kHz and 15kHz. EQ1 is adjusted to attain a reference level by recording and playing back 1 kHz. EQ2 is adjusted similarly with 7kHz and EQ3 is adjusted with 15 kHz. This process is repeated three times until the frequency response becomes flat.
Figure 11 shows system adjustement. The process of adjustment is explained below.

(i) Microprocessor QQ01 outputs data of central values and, with the data, QK01 (02) performs:
    Digital data → DC level → EQ amp gain setup
(ii) The signal recorded in the condition of (i) becomes a signal of DC level through the play head → playback equalizer amplifier → AC/DC amplifier.
(iii) The DC level above is compared with the reference voltage set for the microprocessor.
(iv) The result of comparison is judged and a new data which includes the difference is determined.
(v) Recording of the second time is made with the new data.
(vi) This process is repeated three times.

ADJUSTMENT OF THE RECORDING EQUALIZER OF THE COMPU-BIAS SYSTEM

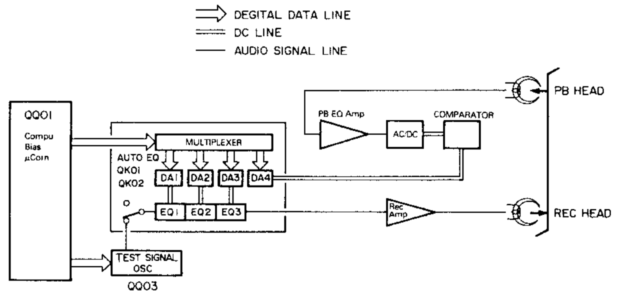
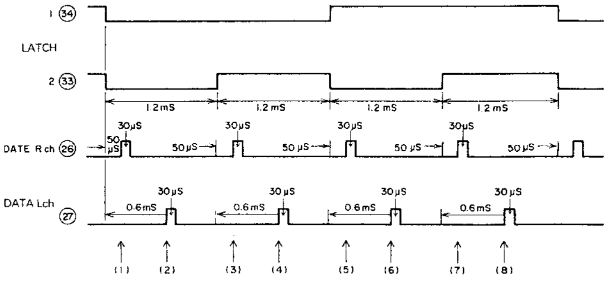

DEGITAL DATA LINE
DC LINE
AUDIO SIGNAL LINE
PB HEAD
QQOI
Compu
Bias
µCoin
PB EQ Amp
COMPARATOR
AC/DC
MULTIPLEXER
AUTO EQ
QKOI
QKO2
DAI
DA2
DA3
DA4
EQ I
EQ2
EQ3
Rec Amp
REC HEAD
TEST SIGNAL OSC
QQO3

Figure 11

TIMING OF TRANSFER OF DATA FROM COMPU-BIAS MICROPROCESSOR QQ01 TO QK01/02


1 34
LATCH
2 33
1.2mS
1.2mS
1.2mS
1.2mS
30µS
50 µS
50µS
DATE R ch 26
DATA Lch 27
0.6mS
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)

(1) DATA of 5 bits enters ㉘ - ㉜ of R-channel EQ1.
(2) DATA of 5 bits enters ㉘ - ㉜ of L-channel EQ1.
(3) DATA of 5 bits enters ㉘ - ㉜ of R-channel EQ2.
(4) DATA of 5 bits enters ㉘ - ㉜ of L-channel EQ2.
(5) DATA of 5 bits enters ㉘ - ㉜ of R-channel EQ3.
(6) DATA of 5 bits enters ㉘ - ㉜ of L-channel EQ3.
(7) DATA of 5 bits enters ㉘ - ㉜ of R-channel DA4.
(8) DATA of 5 bits enters ㉘ - ㉜ of L-channel DA4.

Figure 12

- DATA is entered at the rise of ㉖ and ㉗

Figure 12 shows the timing of DATA transfer from COMPU-BIAS microprocessor QQ01 to auto EQ ICs (QK01/02).

5. Process of end of MAG detection
   When the presence of magnetic tape is confirmed (by detecting level), tests end, the tape is rewound to the START point, "READY" LED lights, and after AUTO REC MUTE 4SEC, REC PAUSE is entered.

4.5.4 Operation after depression of the RESET switch

1. Depression of the RESET switch after the AUTO switch
   - "AUTO" LED goes on → goes off
   - User memory data out

     ↓

     FACTORY memory data out
     (If the pin of PRESET is shorted, only FACTORY data is out regardless of the RESET switch.)
   - Suppose that the "AUTO" LED is on and the mechanism is operating normally. If you depress the RESET switch at this time, the mechanism stops.
2. "RESET" during COMPU-BIAS TEST
   - The "AUTO" LED goes out.
   - FACTORY memory data out
   - After the tape is rewound to the start point, the deck enters STOP mode.

NOTE: If you operates the TAPE SELECTOR during TEST, the deck will be "reset".

4.6. PROGRESS OF TEST AND INDICATOR

Table 2

TEST ITEM	"AUTO" LED	"READY" LED
AUTO SW. ON	LIT	LIT
"START" SW ON MAG DETECTION LEVEL COARSE ADJUSTMENT PEAK BIAS DETECTION	STARTS TO BLINK ON TIME 160ms OFF TIME 160ms	OFF
EQUALIZER ADJUSTMENT	BLINKS ON TIME 160ms OFF TIME 320ms	OFF
END OF TEST REW STOP	BLINKS ON TIME 160ms OFF TIME 160ms	OFF
AUTO REC MUTE	LIT	LIT

4.7. OPERATION OF CIRCUITS

4.7.1 Test signal generator

Figure 13

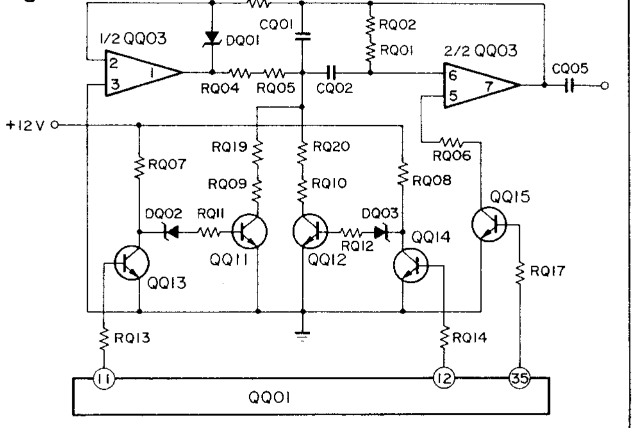
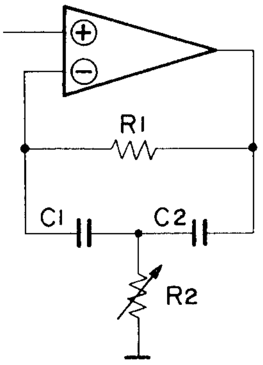

RQ03
CQ01
RQ02
1/2 QQ03
DQ01
RQ01
2/2 QQ03
CQ05
2
3
1
6
5
7
RQ04
RQ05
CQ02
+12V
RQ19
RQ20
RQ06
RQ07
RQ09
RQ10
RQ08
QQ15
DQ02
RQ11
DQ03
QQ14
RQ12
QQ11
QQ12
QQ13
RQ17
RQ13
RQ14
11
12
35
QQ01

Table 3

QQ01 PIN NO.	NO. OSCILLATION	1 kHz	7 kHz	15 kHz
35	0	1	1	1
11	—	1	1	0
12	—	1	0	0

An audio signal used to test COMPU-BIAS is generated in the test signal generator shown in Figure 13.
Table 3 shows the microprocessor's output data which are used to control the oscillator and select frequency.
[Operating principle]
It is an oscillator using a bridged T-filter.
In this model, R2 is changed with an electronic switch to obtain a required frequency.



$$f_0 = \frac{1}{2\pi C_1 R_m}$$

$$C_1 = C_2$$

$$R_m = \sqrt{R_1 \cdot R_2}$$

Figure 14

4.7.2 Recording equalizer control circuit

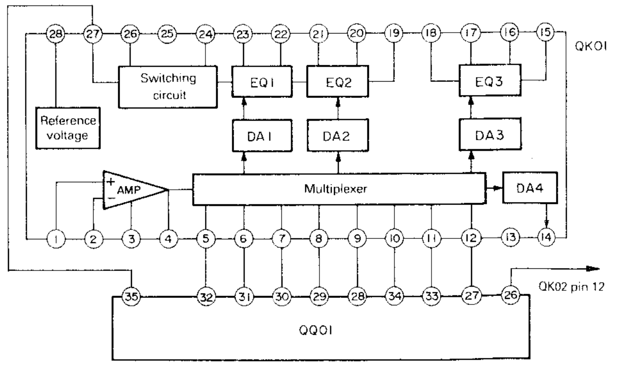

28
27
26
25
24
23
22
21
20
19
18
17
16
15
QK01
Switching circuit
EQ1
EQ2
EQ3
Reference voltage
DA1
DA2
DA3
AMP
Multiplexer
DA4
1
2
3
4
5
6
7
8
9
10
11
12
13
14
QK02 pin 12
35
32
31
30
29
28
34
33
27
26
QQ01

Figure 15

Figure 15 shows a block diagram of IC QK01. This IC incorporates bass/mid-range/treble EQ, latch, D/A converter working to control recording bias and detect playback gain, and playback power amplifier.
As input signals, an external audio signal of line or microphone is supplied to QK01 pin ㉖ and the output signal of the test signal generator to QK01 pin ㉔.
These input signals are, switched by the digital signal supplied from QQ01 to QK01 pin ㉗, delivered to an EQ amplifier that follows. The test signal is selected when level is H, and the external audio signal is selected when level is L.
EQ1, EQ2, and EQ3 are variable-gain amplifiers whose bands are determined with the Coils, Capacitors, and Resistors connected to pins ⑯, ⑰, ⑳, ㉑, ㉒, and ㉓, with gains controlled by 5-bit data coming to pins ⑤ through ⑨.

The 5-bit data of pins ⑤ through ⑨ is subjected to D/A conversion to control gain. D/A converter DA4 operates for a control signal of an external recording bias circuit and playback gain detecting circuit.
During test of COMPU-BIAS, the recording bias circuit is controlled with "DA4" of QK01 and the playback gain detecting circuit by "DA4" of QK02.
Data are given to the eight D/A converters of the L and R channels by time division to reduce the number of IN/OUT terminals. The data are held in latches when they are not changed. The latch to which 5-bit data is sent is determined by 2-bit equalize select signal (pins ⑩ and ⑪ of QK01) and 1-bit channel select signal (pin ⑫ of QK01) which selects either of QK01 or QK02 to write data.
Table 4 shows input data of QK01 and Table 5 selection of DA.

Table 4

QK01 PIN NO.	SIGNAL
9	2^0 WEIGHT (LSB)
8	2^1 WEIGHT
7	2^2 WEIGHT
6	2^3 WEIGHT
5	2^4 WEIGHT (MSB)

Table 5

QK01 PIN NO.	10	11	SELECTION
STATE	0	0	DA1, EQ1
	0	1	DA2, EQ2
	1	0	DA3, EQ3
	1	1	DA4

4.7.3 Recording bias control circuit/erase circuit

1. Erase circuit
   The bias oscillator which comprises QL11 and QL12 drives the erase head. The supply voltage of the oscillator is raised for metal tape to produce better demagnetizing effect. Pin ㉗ of mecha-logic microprocessor becomes High by REC command. This signal goes via QU19, QU25, QU23, and QU22 to QU21 to turn it on and cause the bias oscillator to oscillate. SU01-3 which is the METAL position switch of the tape selector changes the base voltage of QU21 to raise the supply voltage of the oscillator at METAL position.
2. Recording bias circuit
   During the test of COMPU-BIAS, "DA4" of QK01 controls the recording biases of both channels. During normal recording, "DA4" of QK01 controls the recording bias of the L channel and "DA4" of QK02 that of the R channel, switched by transistor switches QL15, QL16, QL13, and QL14 from pin ⑮ of COMPU-BIAS microprocessor QQ01.
   A bias control voltage output from QK01 pin ⑭ comes in to the plus input of comparator QL03 via buffer QQ05.
   On the other hand, the voltage developing across RL15 as the recording bias current flows is passed through an audio-band filter, amplified by QL01, and rectified by QL02. After amplifier and corrected by (1/4) QL03, the DC voltage comes to the minus input of QL03 (3/4).
   If the plus input is higher than the minus input, the output of QL03 is plus, the internal resistance of photocoupler QL07 decreases, more bias current flows, and the output voltage of QL03 (1/4) rises, so that the plus input becomes as high as the minus input. Thus the bias control voltage developing at QK01 pin ⑭ controls the bias.

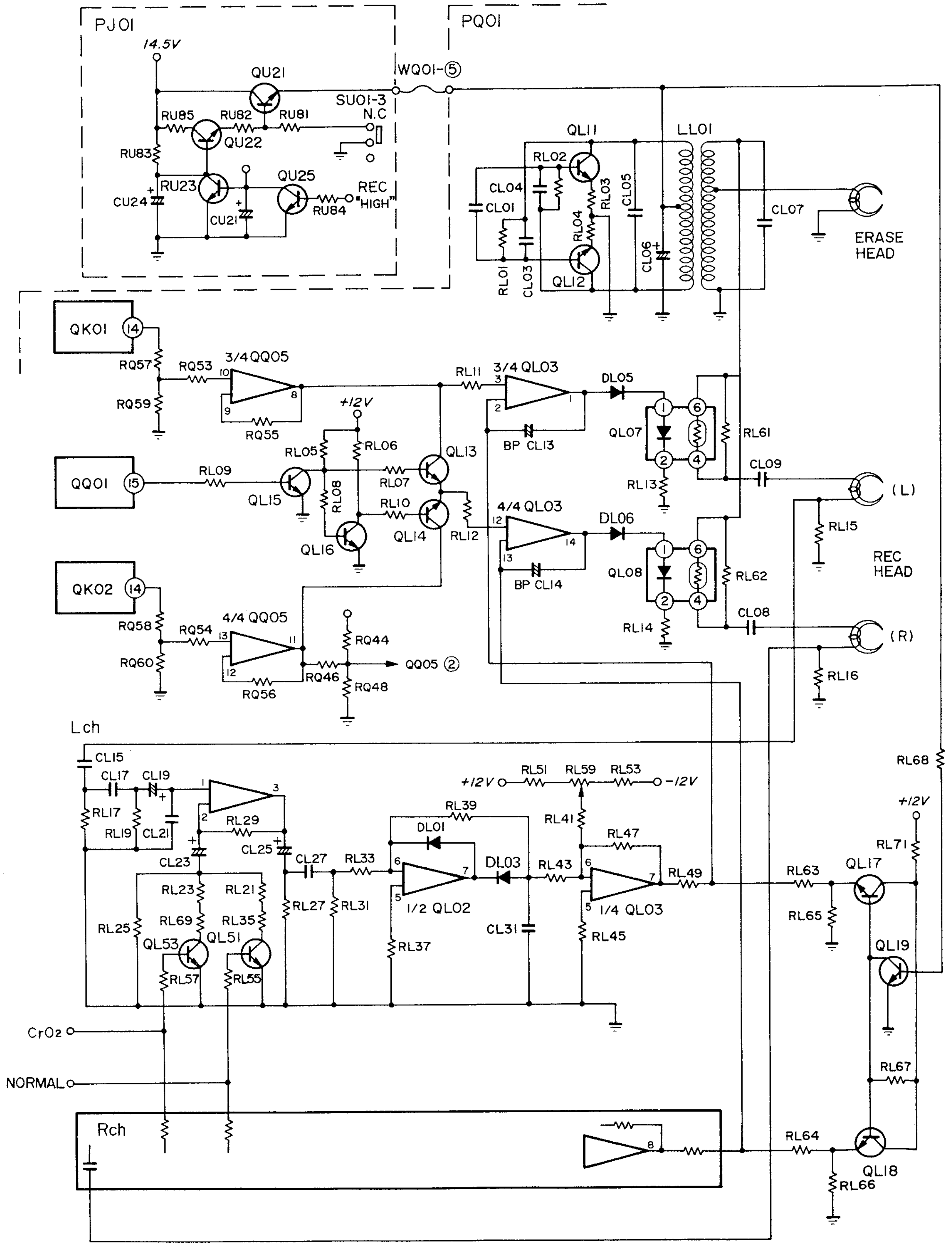

PJ01
14.5V
QU21
WQ01-⑤
PQ01
SU01-3
N.C
RU85
RU82
RU81
RU83
QU22
RU23
QU25
REC
"HIGH"
CU24
CU21
RU84
QL11
LL01
RL02
CL04
CL01
RL03
CL05
CL07
ERASE HEAD
RL04
CL06
RL01
CL03
QL12
QK01
⑭
RQ57
RQ53
3/4 QQ05
RQ59
RQ55
RL11
3/4 QL03
DL05
+12V
QL07
RL61
BP CL13
RL05
RL06
QL13
QQ01
⑮
RL09
QL15
RL07
RL08
RL10
CL09
(L)
RL13
QL16
QL14
RL12
4/4 QL03
DL06
RL15
REC HEAD
QK02
⑭
QL08
RL62
BP CL14
RQ58
RQ54
4/4 QQ05
RQ44
RL14
CL08
(R)
RQ60
RQ46
RQ48
QQ05 ②
RQ56
RL16
Lch
CL15
CL17
CL19
RL51
RL59
RL53
+12V
-12V
RL68
RL17
RL19
CL21
RL29
RL39
+12V
RL41
CL23
CL25
DL01
RL47
RL71
CL27
RL33
DL03
RL43
QL17
RL63
RL49
RL23
RL21
1/2 QL02
1/4 QL03
RL25
RL69
RL35
RL27
RL31
CL31
RL65
QL53
QL51
RL37
RL45
QL19
RL57
RL55
CrO2
NORMAL
RL67
Rch
RL64
QL18
RL66

Figure 16

4.7.4 Playback gain detecting circuit

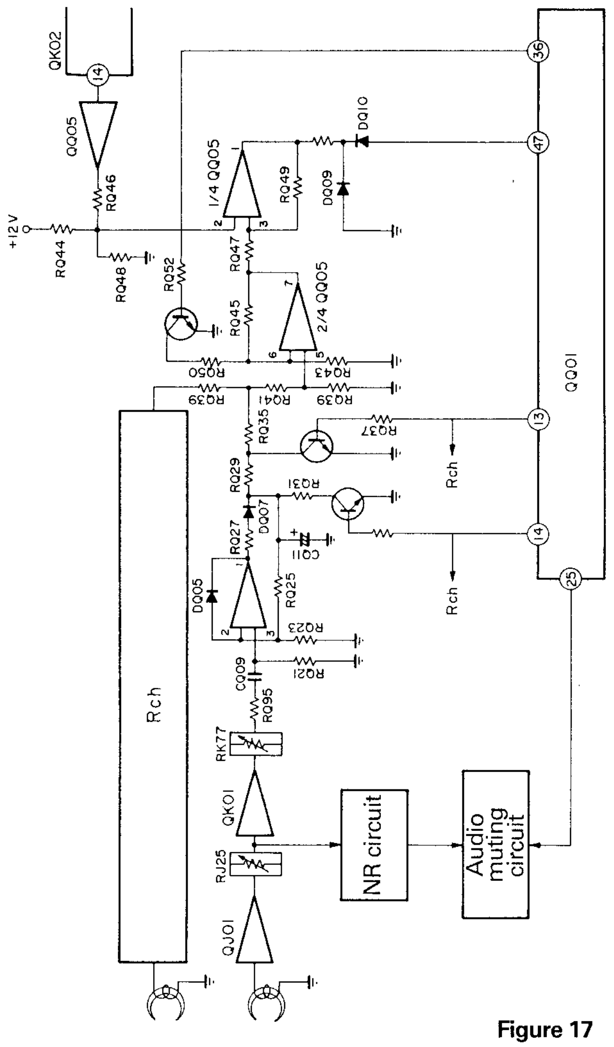

QK02
14
QQ05
RQ46
+12V
RQ44
RQ48
RQ52
RQ47
1/4 QQ05
RQ49
DQ09
DQ10
36
47
2/4 QQ05
RQ45
RQ50
RQ43
RQ39
RQ41
RQ39
RQ35
RQ37
RQ29
RQ31
DQ07
RQ27
CQ11
DQ05
RQ25
RQ23
CQ09
RQ21
RQ95
RK77
QK01
RJ25
QJ01
Rch
Rch
Rch
13
14
25
QQ01
NR circuit
Audio muting circuit

Figure 17

The playback gain detecting circuit detects the playback output of the test signal recorded with control data given to the recording equalizer and the recording bias control circuit, and converts analog signal to digital signal. Figure 17 shows the playback gain detecting circuit. It comprises amplifiers, sample & hold, L/R input selector, and comparator (A/D converter). COMPU-BIAS microprocessor QQ01 controls the circuit as follows.

1. L/R channel input selection
   Inputs to a comparator are switched to detect the playback output of the L and R channels. An L/R select signal is output from pin ⑬ of COMPU-BIAS microprocessor QQ01. "High" level selects the R channel and Low Level the L channel.
2. Resetting sample & hold
   CQ11 samples and holds the demodulated signal which is converted to DC. Before performing tests, turn on QQ17 to discharge the electricity held in CQ11. The sample & hold gets reset when QQ01 pin ⑭ turns to "High" level.
3. D/A control
   The data sampled and held comes to the plus input of a comparator (1/4 QQ05). On the other hand, the DC voltage which is converted from the 5-bit signal output from QK02 pin ⑭ enters in the minus input via a buffer (3/4 QQ05). From pins ㉘ ~ ㉜ of COMPU-BIAS microprocessor QQ01, 5-bit data starts from "00000B" and rises step by step until the voltage becomes equal to the plus input. At this time, the output of the comparator (1/4 QQ05) changes from "High" level to "Low" level and enters QQ01 pin ㊷ so that the playback level may be detected.
4. Changing gain during detection of peak bias
   The reference level is adjusted to the central value ("10000B") of 5 bits. In detection of peak bias, it is enough to detect a peak. During this time, therefore, gain is raised by 50% after the playback signal is converted to DC. As High level is output from QQ01 pin ㊱, QQ28 turns on and the gain of (2/4 QQ05) is raised for the above purpose. This improves capability of detecting level by 50%.
5. Muting monitor signal
   During test, "High" level is output from QQ01 pin ㉕ and applied to the audio muting circuit of the audio board (PJ01) to mute the monitor and LED METER signals.

4.7.5 Backup mode circuit

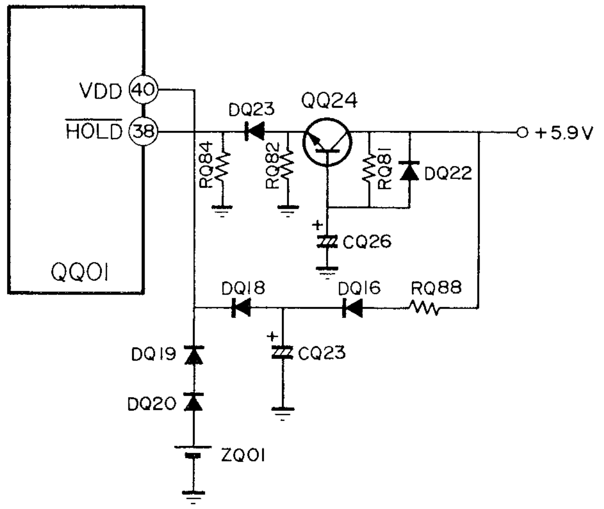

VDD
40
HOLD
38
QQ01
DQ23
QQ24
+5.9V
RQ84
RQ82
RQ81
DQ22
CQ26
DQ18
DQ16
RQ88
DQ19
CQ23
DQ20
ZQ01

Figure 18

When the power switch is off or during interruption of source power, the memory (RAM) of the COMPU-BIAS microprocessor (QQ01) is backed up by an external battery (lithium battery) while the other circuits are inactive. At this time, power consumption is so low that the data held in the RAM are preserved even if the supply voltage (VDD) falls to 2.0V. This is called backup mode.

When power is off, the signal shown below becomes necessary and the circuit shown in Figure 19 generates this signal. Set the HOLD jack to low level.

When the unit enters the HOLD mode, increase the power supply voltage. To release the HOLD mode, return the power supply voltage to normal value and adjust the HOLD jack to high level.

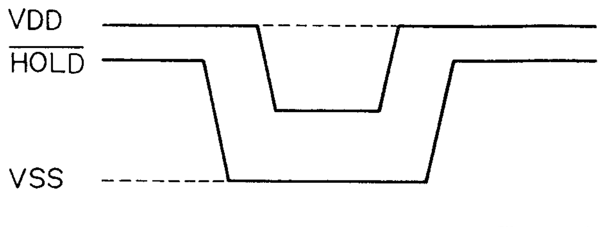

VDD
HOLD
VSS

Figure 19

4.8 MEMORY AND DATA

Data memory of the COMPU-BIAS microprocessor (QQ01) is available in two types; FACTORY SET MEMORY which is set by AUTO operation, using a standard tape, before shipment from the plant, and USER SET MEMORY which the user sets by AUTO operation, using his own tape.

- Selecting auto data input memory
  Short, or open, two PRESET pins on the COMPU-BIAS board (PQ01) to put the data set by AUTO operation into FACTORY SET MEMORY, or USER SET MEMORY.
- Recalling data
  Data may be recalled from the USER SET MEMORY when the AUTO switch has been depressed and the AUTO LED lights. The data is transferred to the auto equalizer (QK01/02).
  At this time, the two PRESET pins of the COMPU-BIAS board (PQ01) must be open. If they are shorted, data of the FACTORY SET MEMORY will be recalled.
- Preserving data in memory
  The data written in the memory will be preserved, backed up by battery.

5. DESCRIPTIONS OF MECHANISM AND CIRCUIT OPERATIONS

5.1 INITIAL CHECK

The following are items to be checked when the mechanism does not work even if the operation button of the set is pressed.

1. Mount the cassette tape and close the cassette door. The "REW" LED indicator should appear on and the supply reel should rotate clockwise slightly until the tape gets straightened.
2. If the above operation does not occur, it indicates that the mechanism control circuit does not work. In such a case check the following:
   - 2-1. Check whether or not pin ㊱ of QU01 is 0 V. If it is not 0 V, check if the EJECT switch (SO73) and the cassette switch (SO71) have been set to ON. Also check if QU11 is on.
   - 2-2. Check whether or not clock pulses are generated. Pluse signals haveing a frequcny of approximately 400 kHz should appear at pins ① and ㊷.
   - 2-3. Check whether or not a voltage of +5 V appears at pin ㊶.

NOTE: This set is designed so that it will not operate even if the operation button is pressed unless a tape is mounted on the cassette holder and the cassette door is closed.

5.2 IC OPERATION CIRCUIT

The mechanism is driven by IC outputs. The circuit that generates the IC outputs consists of push switches (SY01 to SY08).

Pulses shown in Figure 24 are generated at pins ② and ③ QU01 and applied to the push switches.

When no cassette tape is mounted or when SO71, SO73 and QU11 are off, that is, when pin ㊱ is 5 V, the outputs at pins ② and ③ remain level at 5 V.

Pressing a push switch will cause the output of pin ② or ③ to be applied to one of pins ㊲ to ㊵ that corresponds to the push switch and cause the outputs of QU01 to change.

NOTES:

1. **Appplying the voltage level 5 V to pins ㊲ to ㊵ will not change the outputs of QU01.**
2. **The width of the pulses output at pins ② and ③ varies.**

5.3 FF/REW OPERATIONS

The power of the reel motor (M072) is supplied by Q806. Since Q807 is normally off, the output voltage of Q806 is 4.6V, a voltage set by D808.

At the STOP condition, the outputs of pins ㉔ and ㉕ are both 5V. Therefore, QU12 and QU13 are off and no voltage is applied to M072.

When the FF button is pressed, the output at pin ㉕ becomes O V and a current flows through QU12, MO72 and then QU15.

Since during the REW operation the output at pin ㉔ is O V, a current flows through QU13, MO72 and then QU14.

5.4 PLAY OPERATION

When the PLAY button is pressed, pin ⑫ turns off and QU10. L071 (play plunger) turns on, causing the head chassis to rise and the pinch roller to press the capstan. At that time, the output at pin ㉓ turns on for 0.2 seconds. As a result, Q809 and D810 turn off and a voltage of approximately 17 V is applied to L071. Then, the output at pin ㉓ turns off, causing D810 and Q809 to turn on and the voltage applied to L071 to decrease to 9.5 V. At this time the plunger is held at its position. The mechanism is characterized in that during the PLAY operation the take-up reel is driven by the reel motor.

For this reason, during the PLAY operation the output at pin ㉔ is O V as in the case of the FF operation, causing the reel motor to rotate in the same direction as the FF operation. At the same time pin ㉒ is also off whereas Q807 is on. Accordingly, the output of Q806 which is the voltage applied to the reel motor is equal to the voltage divided by resistors R813 and R811. The value of this voltage is approximately 3.5 V. In addition, pin ㉙ becomes O V, cancelling the muting state of the line amplifier.

5.5 STOP OPERATION

When the STOP button is pressed while the mechanism is operating, pin ⑬ turns off for 0.4 seconds and QU09. L072 (break plunger) turns on. In addition, the pulses output by Q071, a photo-coupler, which keeps track of the rotation of the take-up reel are applied to pin ㉝. The winding of the tape is ended and the reel stops rotating. The output of Q071 remains level at 5 V or 0.5 V and as no more pulses enter pin ㉝, the mechanism is shut off automatically.

5.6 REC OPERATION

Pressing the REC button only will not activate the mechanism. Therefore, the PLAY or PAUSE button should be pressed at the same time. Also, before pressing the REC button, turn on S072, a switch used to prevent erroneous erasure. In addition, the signal at pin ㉝ must be O V during the REC operation.

The output at pin ㉘ becomes O V, cancelling the muting state of REC AMP only when the REC and PLAY buttons are pressed simultaneously. The signal at pin ㉗ becomes 5 V, putting the circuit in the recording state.

5.7 PAUSE OPERATION

Pressing the PAUSE button only will not activate the mechanism. If it is pressed while the mechanism is executing the PLAY operation or while the PAUSE button is being pressed, the mechanism enters a state similar to STOP. At this time the signals at pins ㉘ and ㉙ becomes 5 V, putting the line amplifier in the muting state.

5.8 SKIP CIRCUIT

- Operation of the inter-music gap detecting circuit

a. Basic operation

RJ15 (L channel) and RJ16 (R channel) compose the outputs of the playback equalizers of both channels and the resulting signal is applied to QJ72 which is a buffer provided to adapt to the low input impedance of QJ73. QJ73 and QJ74 have a gain of approximately 54 dB at 1 kHz. They also limit bandwidth to improve S/N of the detecting system. The amplified signal is then differentiated by CJ75 and RJ80 and the output which develops at the collector of QJ75 is applied to u-com QU01 pin ㉞. When the input exceeds +5V, u-com QU01 detects High and regards that the deck is playing back a music.

b. Band shift

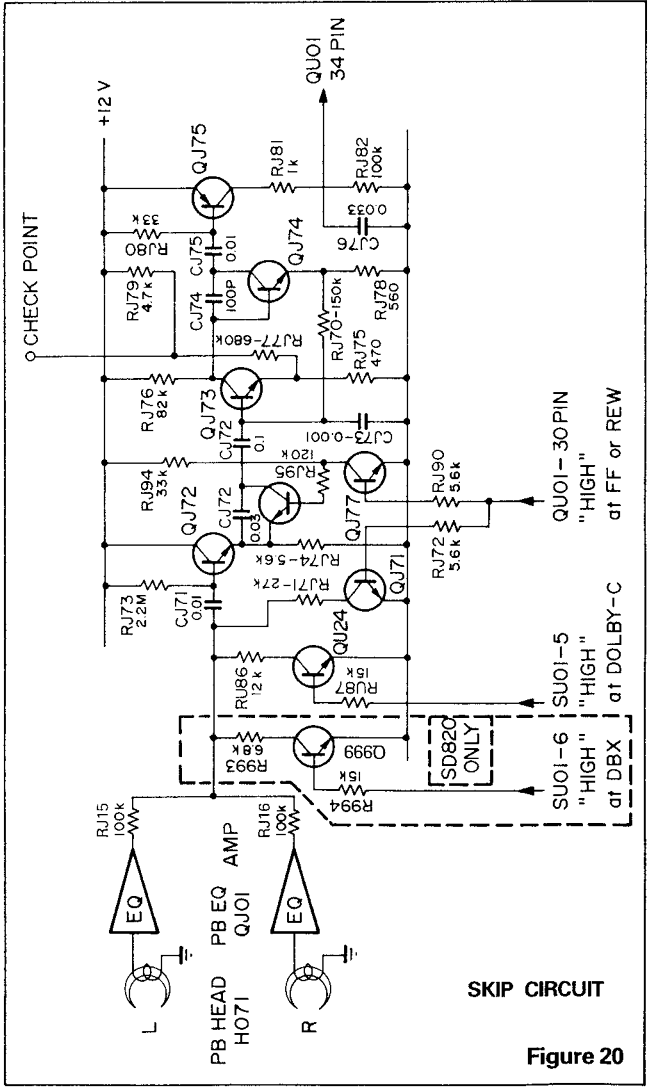
Tape speed varied by 20-25 times as it is played back at the normal speed and at the high speed, and the frequency range of reproduced signals varies similarly. Low-frequency components are cut during fast playback. During normal playback, CJ72 is shorted by QJ76 and CJ76 works to limit bandwidth at low frequencies. During fast playback, u-com QU01 turns on QJ77 and off QJ76, and CJ72 works to limit bandwidth. The resulting characteristic is of a 6dB/oct. band-pass filter of 1.7 kHz during normal playback and 5.5 kHz during fast playback as shown in Figure 21. Detection time must also be varying during normal and fast playback times. u-com QU01 is programmed with the inter-music detection time of approximately 3 sec during normal playback and approximately 100 msec during fast playback. (With the operation time of the mechanism taken into consideration, the nominal detection time is 4 sec.)

c. Gain shift

The inter-music gap detecting circuit performs not only band shift but gain shift. This is to raise gain according to normal-fast frequency shift and for encoding in noise reduction. The result is as follows for normal speed and NR-OFF.

Table 6

	NR-off	Dolby-C	dbX (SD820 dbX)
NORMAL SPEED (1.5kHz)	0	−13.5dB	−17.5dB
HIGH SPEED (5.5kHz)	−7dB	−14.5dB	−17.5dB



SKIP CIRCUIT

Figure 20

Switching is performed as follows.

- During high speed, RJ71 works with QJ71 on.
- Dolby-C: RJ86 works with QU24 on.
- dbX: R993 works with Q999 on.

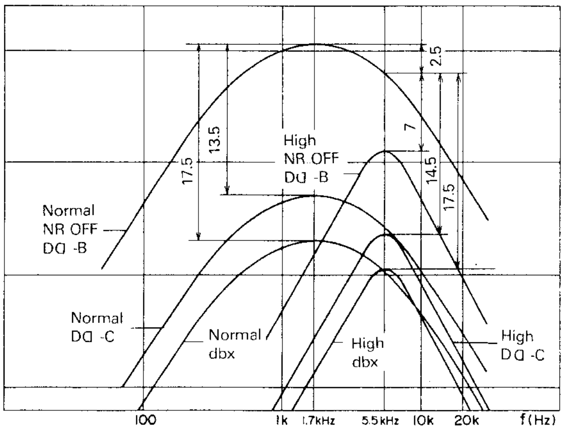


Figure 21

5.9 MUTING

Figure 23 is a block diagram of the muting circuit. Its operation is explained below.

1. Basic operation
   There are three kinds of muting as follows.
   a. Play Mute — muting of the motor drive system
   b. Rec Mute — muting signals to be recorded on tape
   c. Rec signal Mute — muting MIC or Line signals except during recording
   In all cases, the combination of PNP and NPN transistors as shown below is used to mute signals.

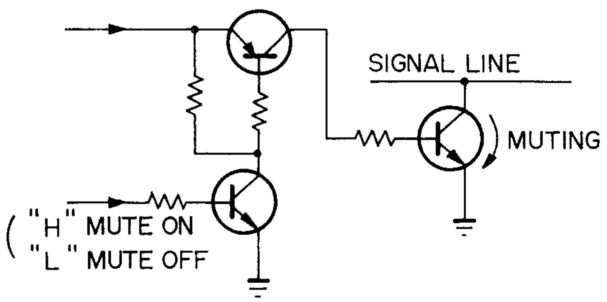


Figure 22

2. Play Mute
   As shown in Figure 23, QJ11 (12) and QJ09 (10) perform muting for all of the monitor system including the line amplifier, meter amplifier, and headphone amplifier. The coverage of muting is as follows.
   1) Direction of QU01 mechanism control microprocessor
      Muting except during PLAY, REC, and REC-PAUSE
      Operating time of the mechanism is taken into consideration and muting is released with a delay of 400 msec.
   2) Direction of QQ01 auto bias control microprocessor
      During auto operation, muting is released completely.
   3) Power on/off
      Immediately after power on and after power off, those which the QU01 mechanism control microprocessor cannot cover are covered.
3. REC MUTE
   As shown in Figure 23, QK11 (12) mutes the REC amplifier.
   4) Direction of QU01 mechanism control microprocessor
      Except during REC, muting is released with a delay time of approximately 600 msec. When directed by the REC MUTE key, muting is released without delay.
   5) Direction of QQ01 Auto Bias control microprocessor
      Direction of Rec Mute is included in the Auto Bias program and, in this case, operation proceeds through the matrix key-SW loop and QU01.
4. Rec signal Mute
   This is muting of MIC of LINE input signal as shown in Figure 23.
   6) Direction of QU01 mechanism control microprocessor
      Rec "High" signal of the microprocessor is inverted to REC "High" by QE24 to perform muting.
   7) Direction of QQ01 Auto Bias control microprocessor
      Muting during the run of the Auto Bias program is performed.

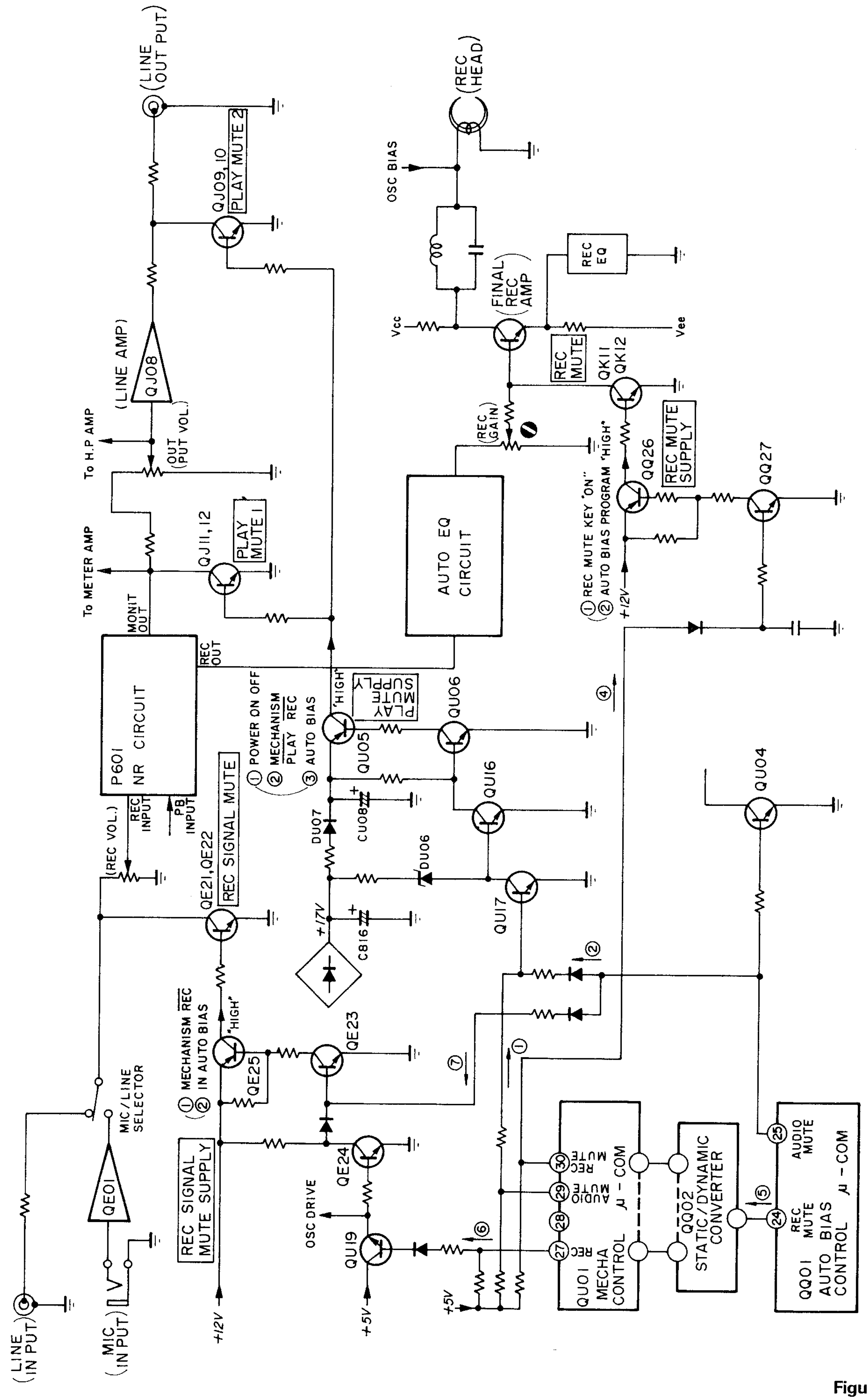
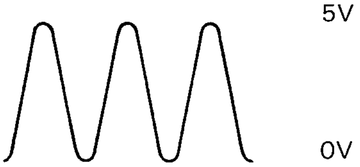

(LINE INPUT)
(MIC INPUT)
QE01
MIC/LINE SELECTOR
REC SIGNAL MUTE SUPPLY
+12V
① MECHANISM REC
② IN AUTO BIAS
"HIGH"
QE25
QE23
QE24
OSC DRIVE
QU19
+5V
⑥
⑦
①
QE21,QE22
REC SIGNAL MUTE
(REC VOL.)
REC INPUT
PB INPUT
P601 NR CIRCUIT
MONIT OUT
REC OUT
To METER AMP
QJ11, 12
PLAY MUTE 1
To H.P AMP
(OUT PUT VOL.)
(LINE AMP)
QJ08
QJ09, 10
PLAY MUTE 2
(LINE OUT PUT)
C816
+17V
DU07
CU08
DU06
QU17
QU16
QU05
QU06
① POWER ON OFF
② MECHANISM PLAY REC
③ AUTO BIAS
"HIGH"
PLAY MUTE SUPPLY
④
②
AUTO EQ CIRCUIT
(REC GAIN)
Vcc
FINAL REC AMP
Vee
REC EQ
OSC BIAS
(REC HEAD)
REC MUTE
QK11 QK12
① REC MUTE KEY "ON"
② AUTO BIAS PROGRAM "HIGH"
+12V
QQ26
REC MUTE SUPPLY
QQ27
QU04
QU01 MECHA CONTROL
27 REC
28
29 AUDIO MUTE
30 REC MUTE
μ-COM
QQ02 STATIC/DYNAMIC CONVERTER
⑤
QQ01 AUTO BIAS CONTROL
24 REC MUTE
25 AUDIO MUTE
μ-COM

Figure 23

5.10 CHECKING VOLTAGE OUTPUT AT PINS OF QU01

①

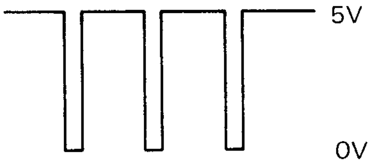


f:400KHz

④ N.C

② ③ ⑤ No cassette tape is mounted

With a cassette tape mounted

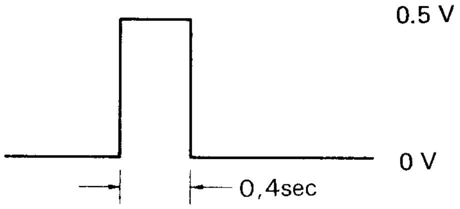


⑥ ⑦ ⑧ 5V

⑨ ⑩ ⑪ N.C

⑫ For PLAY 0.5V and for other modes 0 V

⑬ Brake



⑭ For PLAY 0.5V and for other modes 0 V

⑮ For REC 0.5 V and for other modes 3 V

⑯ For PAUSE 0.5 V and for other modes 3 V

⑰ For PLAY 0.5 V and for other modes 3 V

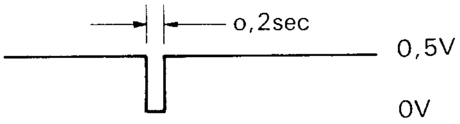
⑱ For REW 0.5 V and for other modes 3V

⑲ For FF 0.5 V and for other modes 3V

⑳ ㉑ GND

㉒ For PLAY 0.5 V and for other modes 3 V

㉓ With each plunger turned on:



㉔ For REW 0V and for other modes 5 V

㉕ For FF/PLAY 0 V and for other modes 5 V

㉖ N.C

㉗ For REC 5 V and for other modes 0 V

㉘ For REC/PLAY 0 V and for other modes 5 V

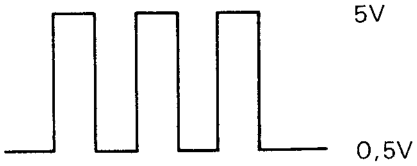
㉙ For PLAY, REC/PLAY and REC/PAUSE 0 V and for other modes 3 V

㉚ For FF and REW 3 V and for other modes 0 V

㉛ With the REC/MUTE or SKIP MEMO button pressed 2 V; otherwise 0 V

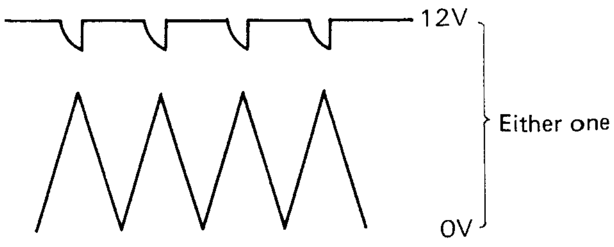
㉜ N.C

㉝ For PLAY, FF and REW:



For STOP or PAUSE 5 V or 0.5 V

㉞ PLAY or SKIP (A recorded tape is used):



For other modes 0 V

㉟ With an erroneous erasure proof cassette mounted 0 V; otherwise 5 V

㊱ With a cassette tape mounted 0 V; otherwise 5 V

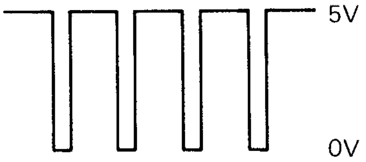
㊲ ㊳ ㊴ ㊵ (With no buttons pressed) 5 V

With one of the above buttons pressed

㊲ Rec Mute
Skip Memo

㊳ Rec FF

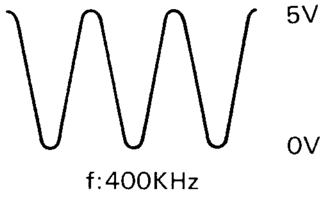
㊴ Play ReW
Timer Rec
Timer play



㊵ Stop Pause

㊶ VDD

㊷



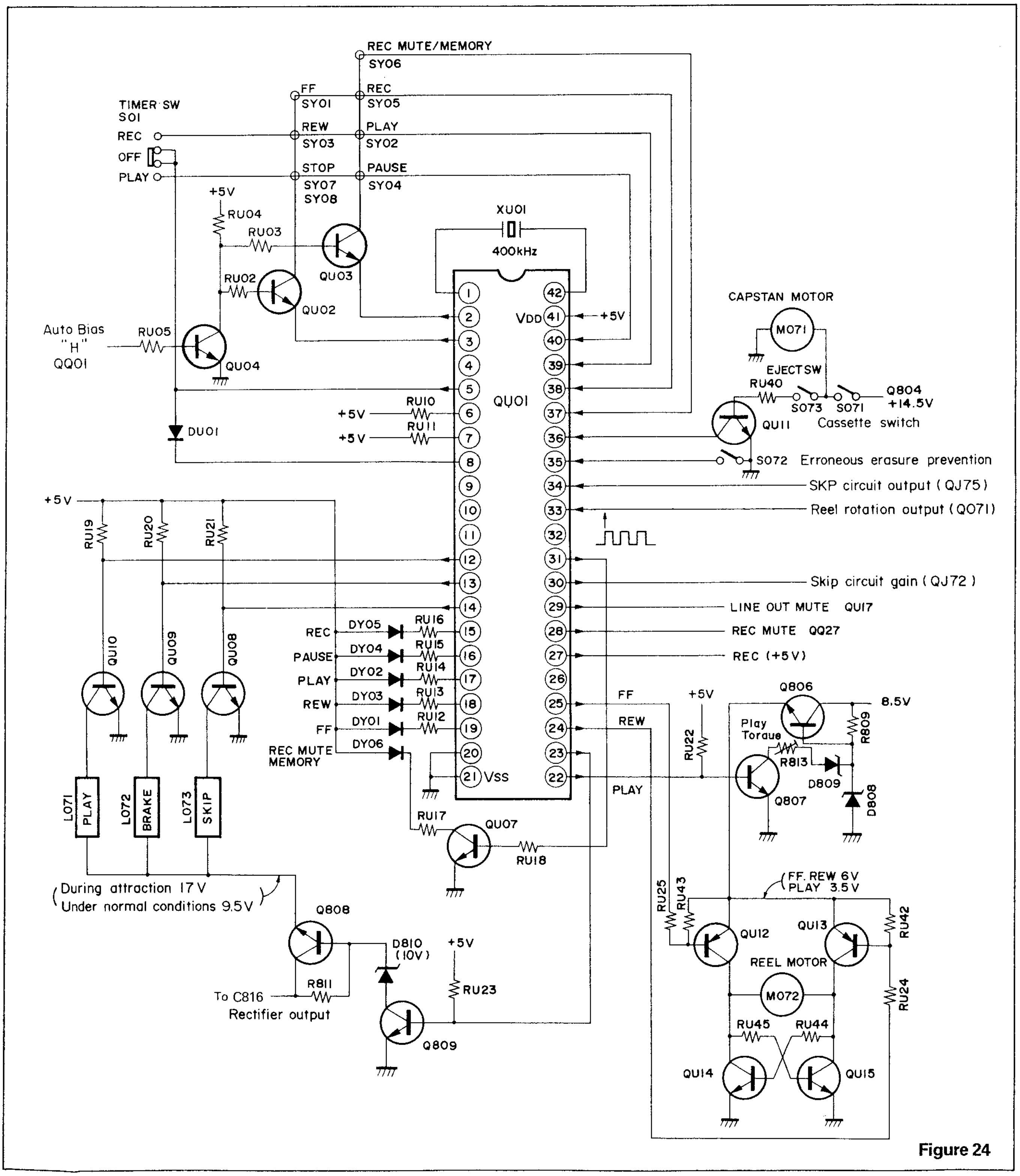

REC MUTE/MEMORY
SY06
FF
SY01
REC
SY05
TIMER SW
S01
REC
OFF
PLAY
REW
SY03
PLAY
SY02
STOP
SY07
SY08
PAUSE
SY04
+5V
RU04
RU03
QU03
RU02
QU02
Auto Bias
"H"
QQ01
RU05
QU04
DU01
XU01
400kHz
VDD
+5V
QU01
RU10
+5V
RU11
+5V
Vss
CAPSTAN MOTOR
M071
EJECT SW
RU40
S073
S071
Q804
+14.5V
QU11
Cassette switch
S072
Erroneous erasure prevention
SKP circuit output (QJ75)
Reel rotation output (Q071)
Skip circuit gain (QJ72)
LINE OUT MUTE QU17
REC MUTE QQ27
REC (+5V)
+5V
RU19
RU20
RU21
QU10
QU09
QU08
L071
PLAY
L072
BRAKE
L073
SKIP
REC
PAUSE
PLAY
REW
FF
REC MUTE
MEMORY
DY05
DY04
DY02
DY03
DY01
DY06
RU16
RU15
RU14
RU13
RU12
RU17
QU07
RU18
FF
REW
PLAY
+5V
RU22
Q806
8.5V
Play
Torque
R809
R813
D809
Q807
D808
During attraction 17V
Under normal conditions 9.5V
Q808
R811
To C816
Rectifier output
D810
(10V)
+5V
RU23
Q809
FF. REW 6V
PLAY 3.5V
RU25
RU43
QU12
QU13
RU42
REEL MOTOR
M072
RU24
RU45
RU44
QU14
QU15

Figure 24

5.11 OPERATING PRINCIPLES OF THE SD820 dbx system

- Encoding
  The input signal is compressed to 1/2 according to the recording characteristic (REC) shown in Figure 25 before it is sent to the deck's recording circuits, so that signals of high levels are not affected by saturation of tape and those of low levels not affected by tape hiss.
- Decoding
  The playback output of the deck is sent to the decoder which expands the signal by doubling it according to the playback characteristic (PLAY) shown in Figure 25. Thus the signals compressed and recorded restore their original levels and they may have a dynamic range twice as large as of the tape. Compression and expansion are linear on logarithmic scales, regardless of frequency.

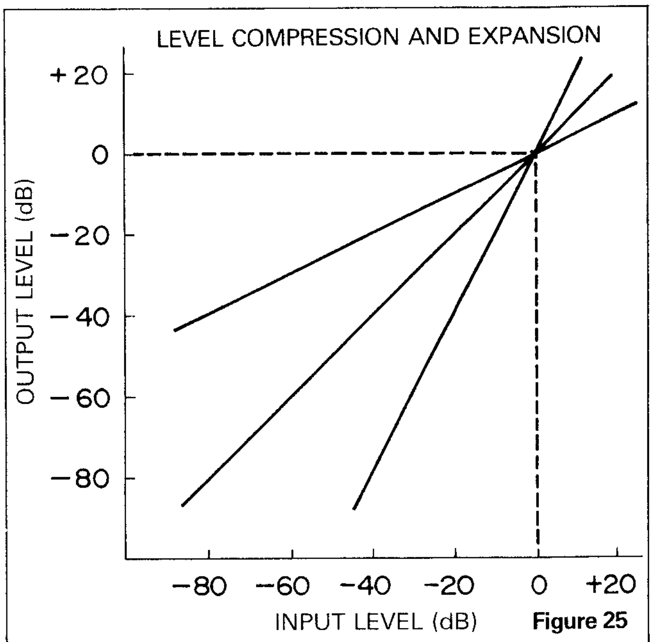


Figure 25

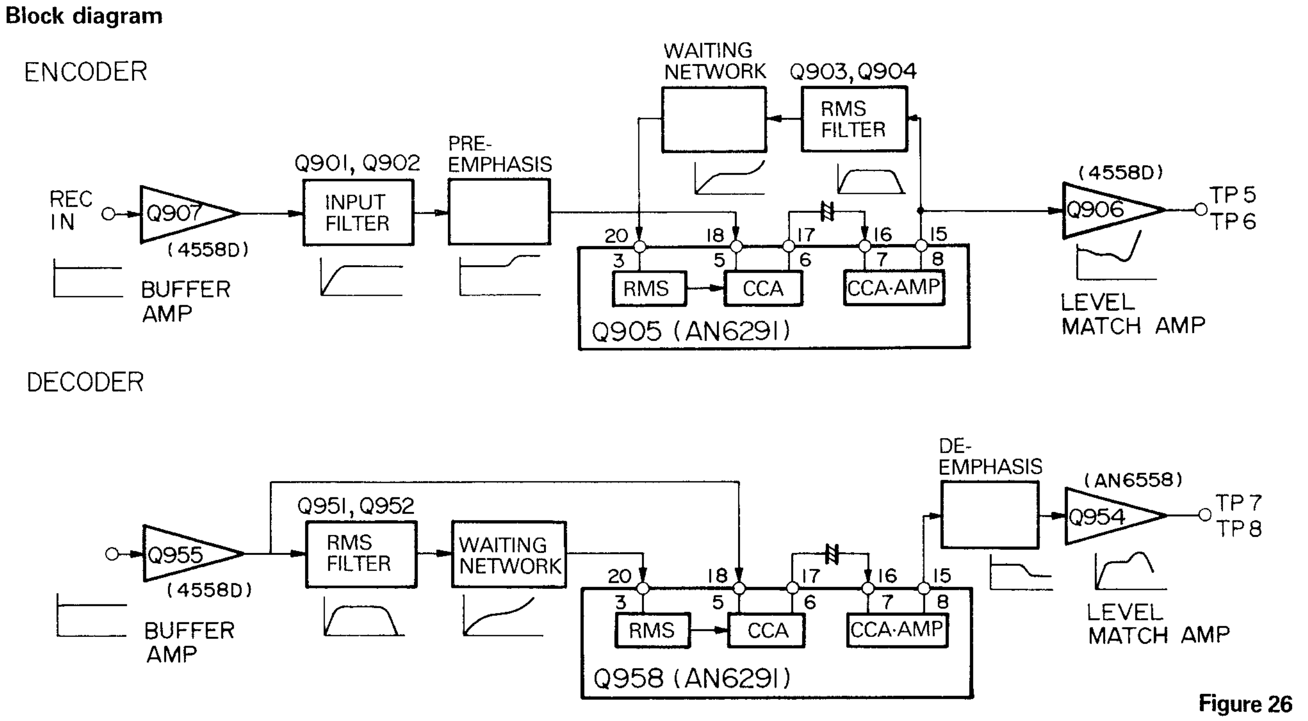

Block diagram
ENCODER
REC IN
Q907
(4558D)
BUFFER AMP
Q901, Q902
INPUT FILTER
PRE-EMPHASIS
WAITING NETWORK
Q903,Q904
RMS FILTER
20
18
17
16
15
3
5
6
7
8
RMS
CCA
CCA·AMP
Q905 (AN6291)
(4558D)
Q906
TP5
TP6
LEVEL MATCH AMP
DECODER
Q955
(4558D)
BUFFER AMP
Q951, Q952
RMS FILTER
WAITING NETWORK
20
18
17
16
15
3
5
6
7
8
RMS
CCA
CCA·AMP
Q958 (AN6291)
DE-EMPHASIS
(AN6558)
Q954
TP7
TP8
LEVEL MATCH AMP

Figure 26

The frequency characteristics of the encoder and decoder are determined with external Capacitors and Resistors connected to AN6291.

Characteristics of encoder and decoder

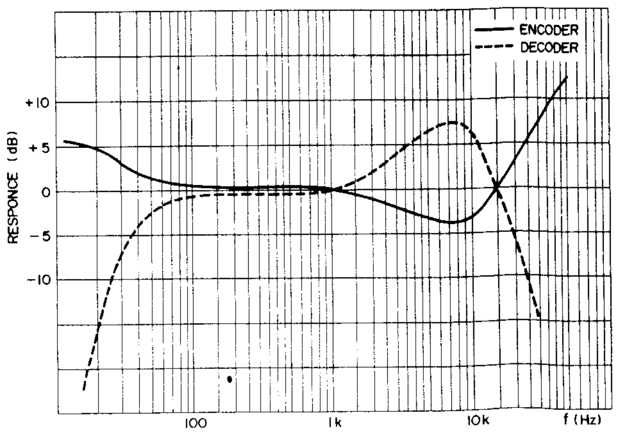


Figure 27

5.11.1 Reference level

The reference level of AN6291 is 20mVRMS and the output stage has a gain which is large enough for level matching with the Dolby output stage. The filter input stage includes a buffer amplifier which prevents reduction of level which might cause at high frequencies due to the output impedance of the preceding stage. This buffer amplifer also prevents reduction of input impedance for line input.

5.11.2 Dolby level dbx reference level

To raise saturation level sufficiently, the dbx reference level of 20mV is lowered for the Dolby level of 0 dB. As a result, if the dbx reference level is assumed as 0 dB when the 3% distortion level is +5 dB, the maximum recording level (3% distortion) is +10 dB. If the dbx reference level is assumed as −5 dB, the maximum recording level (3% distortion) is +20 dB, with the rise of 10 dB. To make use of the characteristic of dbx (expansion of dynamic range) completely, the reference level is set at −4 dB with reference to the DD level during recording. The dbx encoder output level during proper recoding mode and the dbx decoder output level during proper playback mode (with MTT-150) are as follows.

Table 7

	TEST POINT	OUTPUT
ENCODER	5, 6	306.5 mV
DECODER	7, 8	871 mV

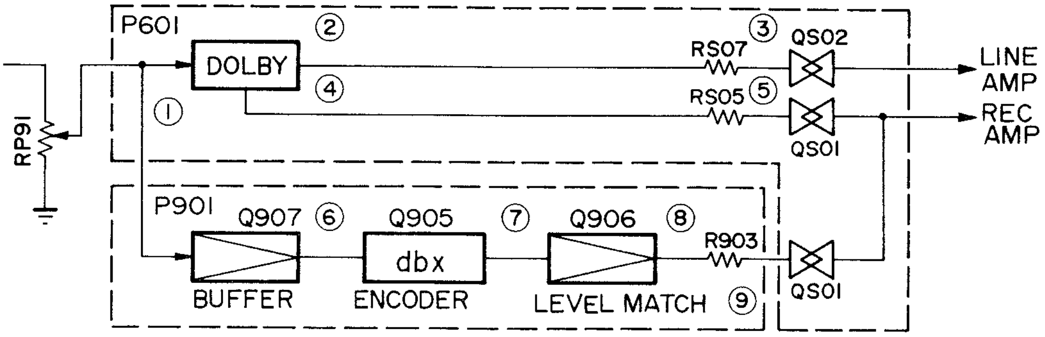
5.11.3 Timing current adjustment

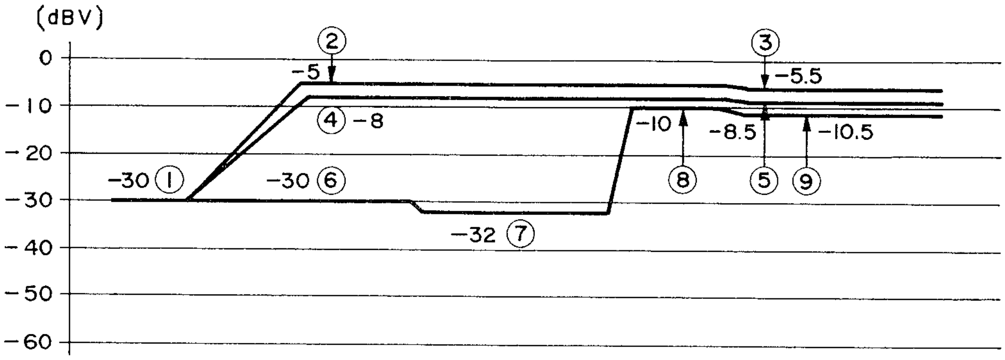
Input 1 kHz/20 mV signal to both channels of the encoder and decoder.

a. Decoder
   Measure voltage across R791 (1 kohms) (across TP11 and TP12). Adjust semi-fixed variable resistor R792 so that the voltage become 15.0 mV.

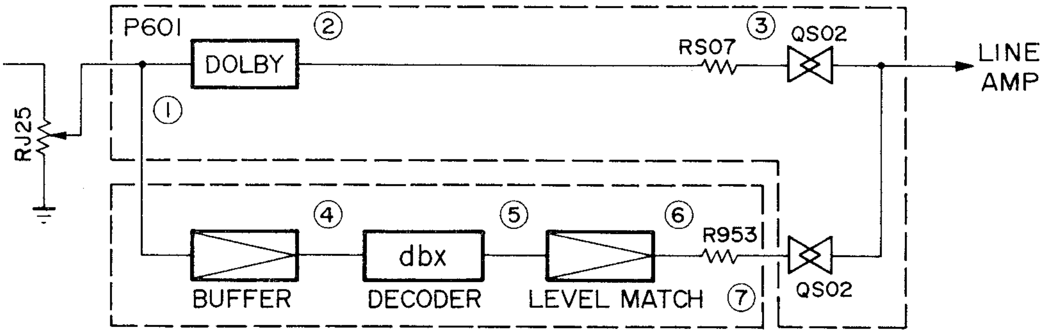
b. Encoder
   Measure voltage across R949 (1 kohms) (across TP9 and TP10). Adjust semi-fixed variable resistor R950 so that the voltage become 15.0 mV.
   - Use a DC voltmeter to measure voltage.

LEVEL DIAGRAM
RECODE MODE


P601
DOLBY
②
④
①
RS07
③
QS02
RS05
⑤
QS01
LINE AMP
REC AMP
RP91
P901
Q907
⑥
Q905
⑦
Q906
⑧
dbx
R903
QS01
BUFFER
ENCODER
LEVEL MATCH
⑨



PLAY BACK MODE


P601
DOLBY
②
①
RS07
③
QS02
LINE AMP
RJ25
④
⑤
⑥
R953
dbx
QS02
BUFFER
DECODER
LEVEL MATCH
⑦

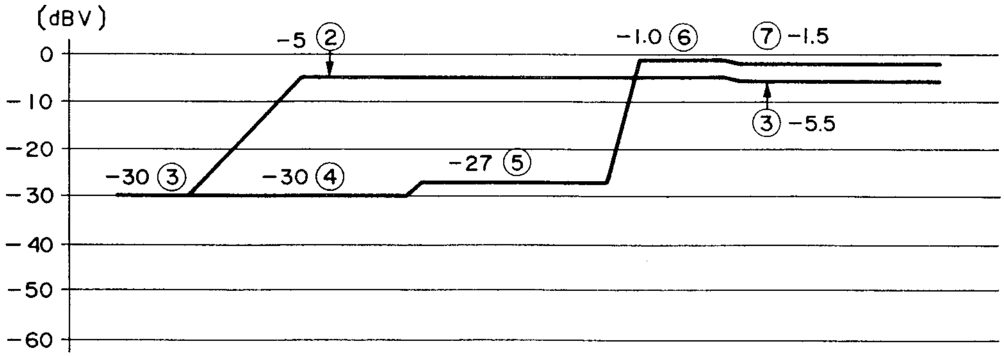
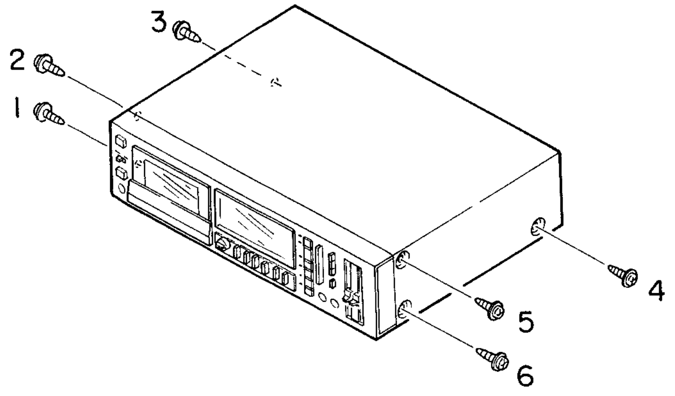


Figure 28

6. DISASSEMBLY

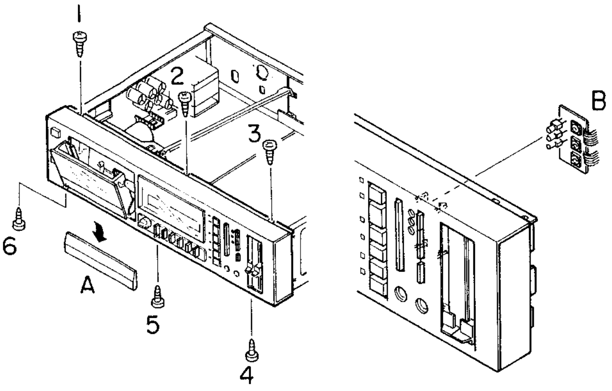
6.1 REMOVING THE TOP COVER

Remove the six screws 1~6.



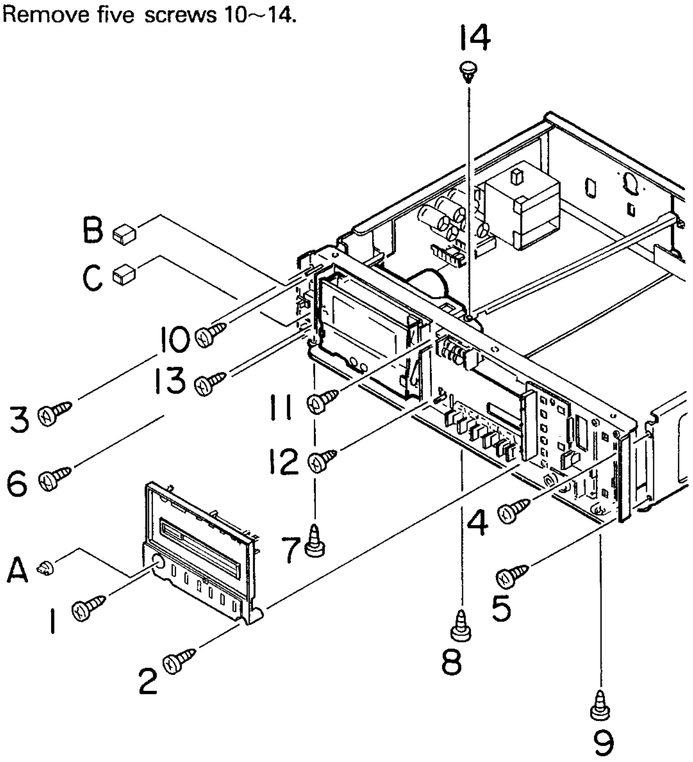
6.2 REMOVING THE FRONT PANEL

Remove escutcheon A.
Remove six screws 1~6.
Remove the auto indicator P.W. Board B.



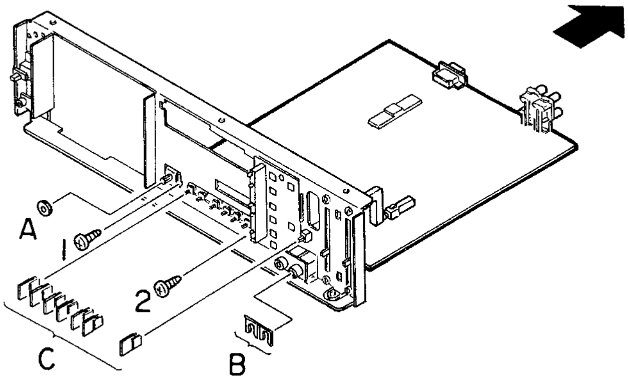
6.3 REMOVING THE MECHANISM

Remove knob A.
Remove two screws 1~2 and pull out the holder to the front.
Remove buttons B and C.
Remove seven screws 3~9 and pull out the front chassis to the front.
Remove five screws 10~14.



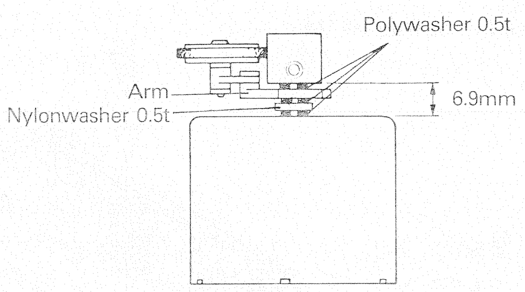
6.4 REMOVING THE P.W. BOARD

Remove nut A.
Remove stopper B.
Remove button C.
Remove two screws 1~2.



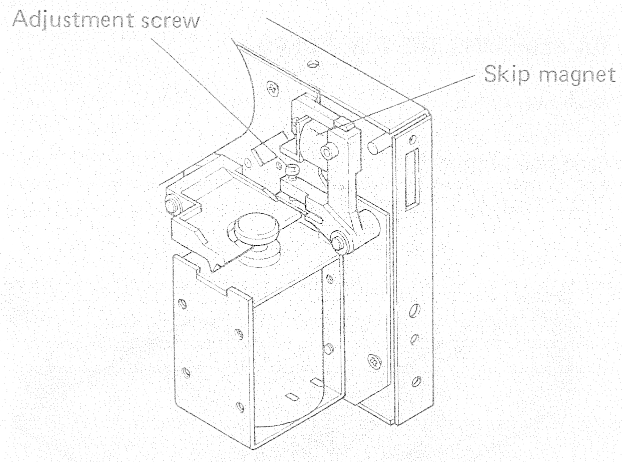
7. MECHANISCAL ADJUSTMENT

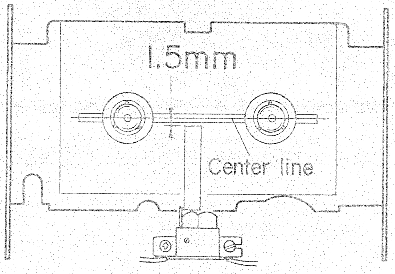
7.1 F/R MOTOR PULLEY POSITION



Insert the polywasher 0.5t, the nylon 0.5t, and poly washer 0.5t, the F/R arm and then the polywasher 0.5t into the F/R motor. Install the Pulley by attaching it firmly.
After installing the Pulley, make sure that the F/R arm can rotate easily and smoothly.
Note that the gap between the motor and the Pulley is approximately 6.9 mm.

7.2 ADJUSTMENT OF THE HEAD POSITION DURING CUE/REC



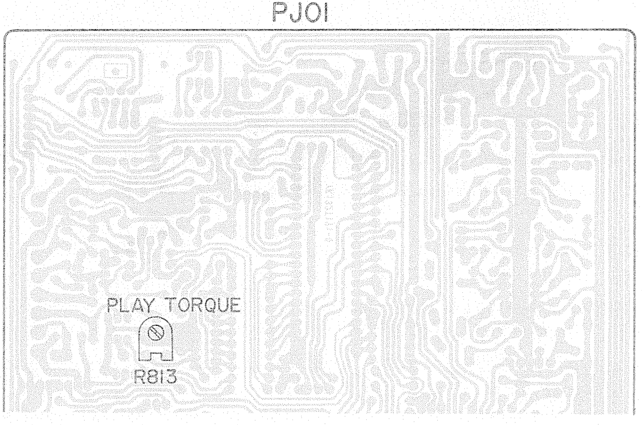


Set the operation of the mechanism to the CUE/SET mode and adjust the postition of the head using the M300 tool by turning the adjustment screw so that the head is located in a position 1.5 mm below the cente line.

7.3 PLAY TAKE-UP TORQUE

Please implement the following adjustment by using the torque meter of cassette type.
Adjust the semi-fixed resistor R813 so as to give a torque having a value in the range 35 to 50 g-cm.
In the mechanism of SD720/SD820dbx. it is normal that the fluctuation of torque value is less than 15 g-cm.
The above torque range is the center value of fluctuation range.

PJ01 P.W. Board



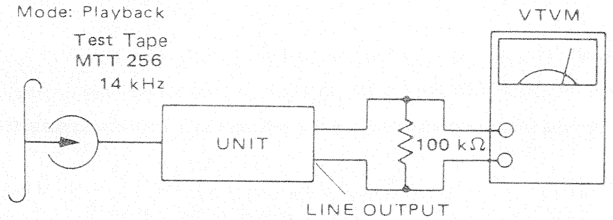
8. ELECTRICAL ADJUSTMENTS

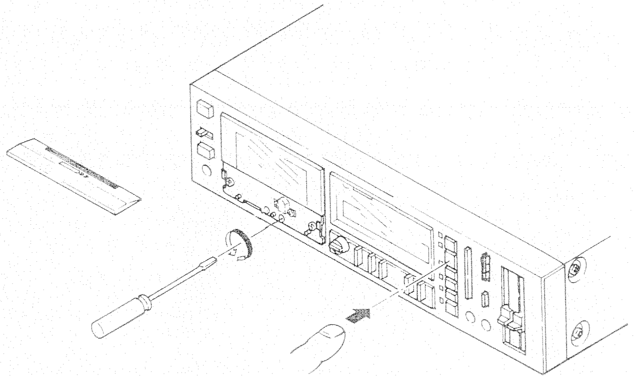
Precautions before Adjustment

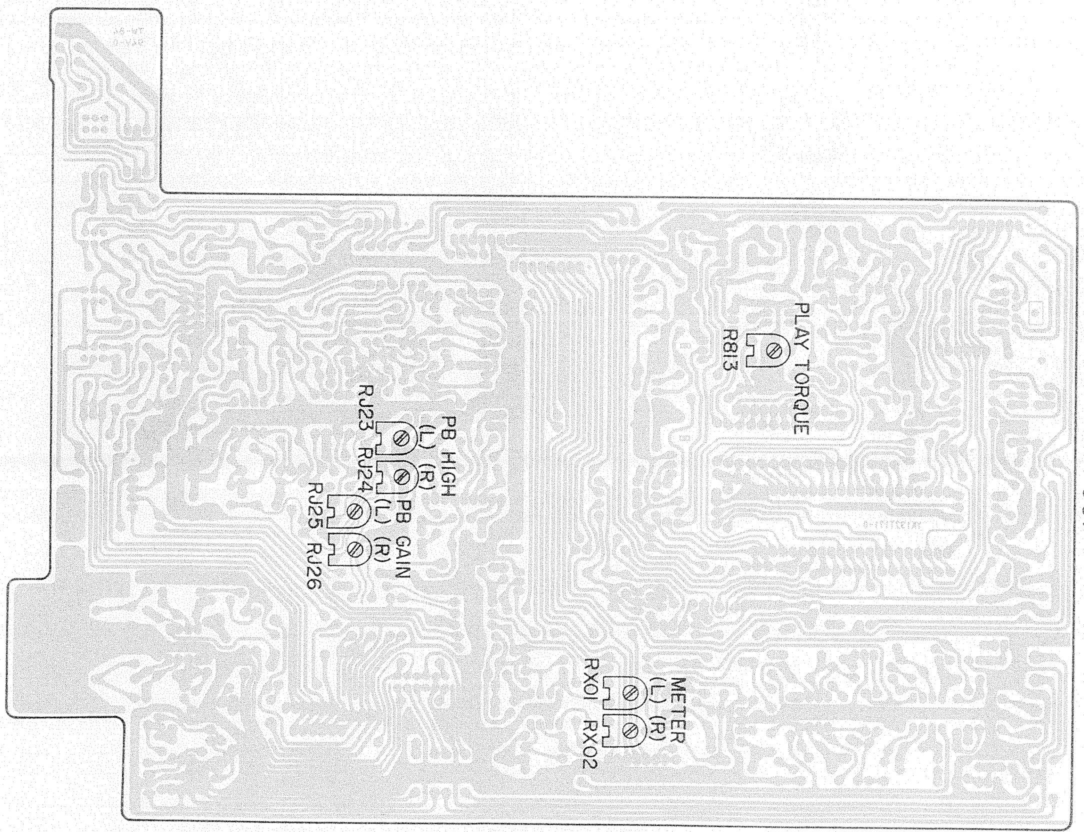
1. Before playing the test tape back, thoroughly demagnetize the heads, capstan and similar metal parts using an eraser as the test trape-recorded tone is easily erased.
2. Do not place the test tape on any measuring instrument.
3. Do not put the test tape near a place where the eraser is used.
4. Method of Demagnetization: — Turn the eraser power switch on at a remote position far away from the heads. Bring the eraser close to the heads, capstan and other parts to be demagnetized, and move it up and down four or five times to demagnetize. Slowly separate the eraser far away from the parts, and turn the power switch off.
5. Do not use any magnetize it from time to time in the course of each adjustment.
6. Do not turn semi-fixed resistor more than needed.
7. Do not apply locking bond excessively.

8.1 HEAD AZIMUTH ADJUSTMENT

1. Remove the cassette door lid and the escutcheon.
2. Set the TAPE SELECT switch to the NORM position.
3. Play the 14 kHz signal of the test tape MTT256, back. Adjust the head azimuth adjusting screw for maximum VTVM reading.
4. If the peak output reads of the right and left channels are different, set the screws to obtain the mechanical center between the peaks.
5. After adjustment, repeat the playback and stop setting a few times to make certain of no head azimuth deviation. Then, lock the screws with bond.





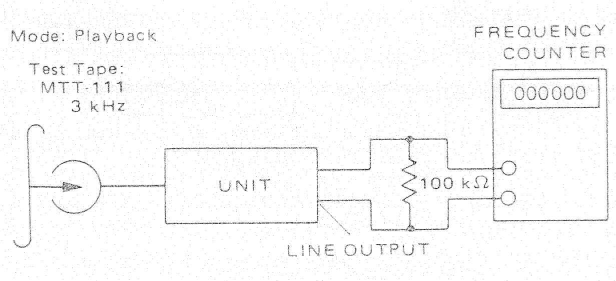


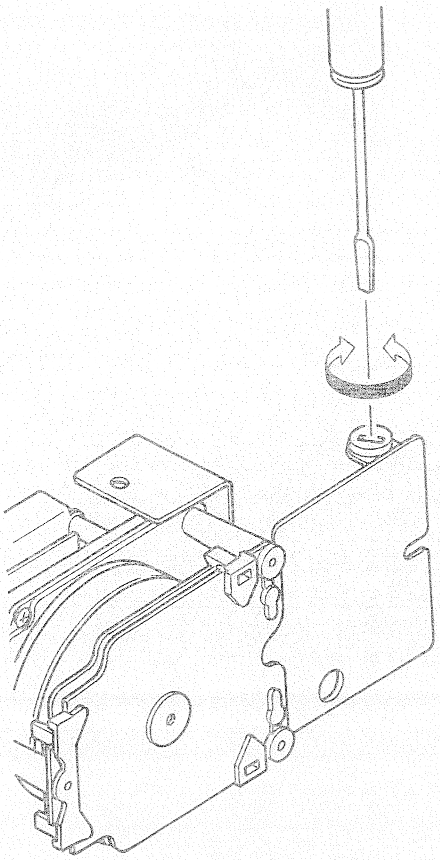
8.2 TAPE SPEED ADJUSTMENT

Play the 3 kHz signal of the test type MTT-111 back. Adjust the tape speed adjusting resistor inside the motor (M001) for 2990 to 3010 Hz counter indication.

NOTES:

1. **If a strong shock of similar vibration is applied to the back after adjustment, make certain that the measured tape speed had not changed.**
2. **Be careful that the frequency counter may indicate a wrong value because of too low counter input level.**
3. **Before adjustment, allow for 30 seconds or more after depressing of the PLAY button.**


Mode: Playback
Test Tape:
MTT-111
3 kHz
UNIT
100 kΩ
FREQUENCY COUNTER
000000
LINE OUTPUT

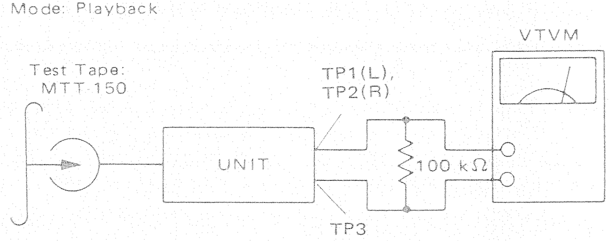


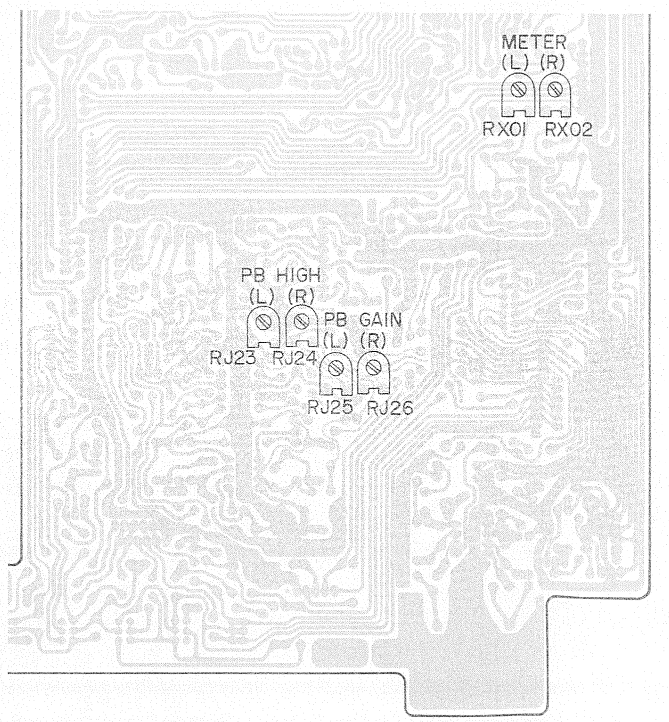
8.3 PLAYBACK OUTPUT LEVEL ADJUSTMENT

1. Set the TAPPE SELECT switch to the NORM position
2. Play the test tape MTT-150 back. Adjust RJ25(L) and RJ26(R) (50 kΩ each in PJ01) for 390 mV playback output level at the test points TP1(L) or, TP2(B) and TP3(GND) in P601. (Dolby NR P.W.B)

NOTES:

1. **Proceed both for the right and left channels in the same manner.**
2. **This adustment should be performed after the one for the "Playback Equalizer Adjustment".**


Mode: Playback
Test Tape:
MTT-150
UNIT
TP1(L),
TP2(R)
100 kΩ
VTVM
TP3
(GND)

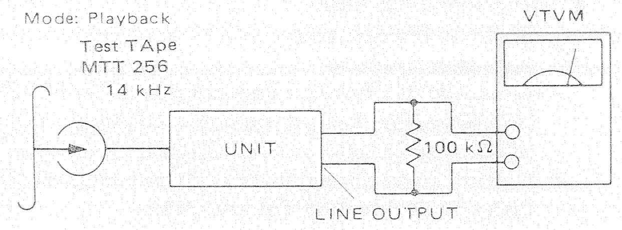

METER
(L) (R)
RX01 RX02
PB HIGH
(L) (R)
RJ23 RJ24
PB GAIN
(L) (R)
RJ25 RJ26

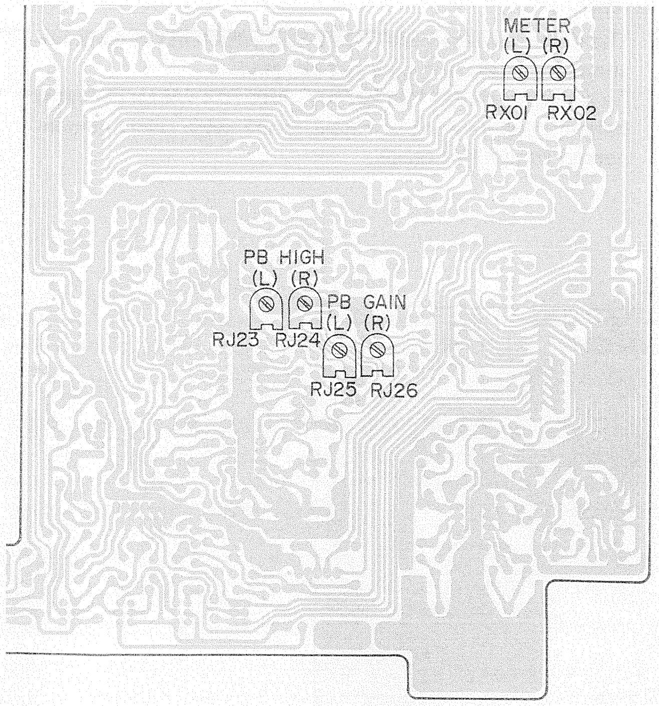
8.4 PLAYBACK EQUALIZER ADJUSTMENT

1. SELECT the NORM position of the TAPE SELECT switch.
2. Play the 315 Hz signal of the test tape MTT-256 back. Let the 315 Hz signal level be reference as 0 dB.
3. Play the 12.5 kHz signal of the test tape MTT-256 back. Adjust RJ23 (L) and RJ24 (R) (50kΩ each) for 12.5 kHz frequency response of 0 to −1 dB in reference to the 315 Hz signal level.

NOTES:

1. **Proceed both for the right and left channels in the same manner.**
2. **Note that clockwise turning of RJ23 (L) and RJ24 (R) will increase the 14 kHz signal output level.**

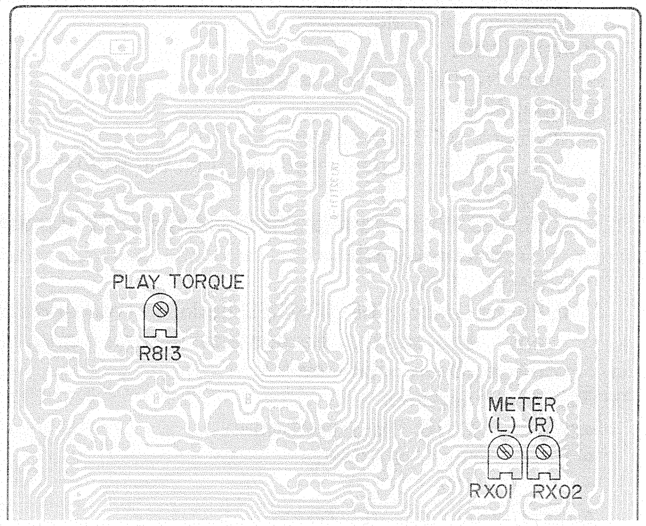




8.5 LEVEL PEAK LEVEL METER ADJUSTMENT

1. Follow the same procedures as in the "Playback Output Level Adjustment" section.
2. Adjust RX01 (L) and RX02 (R) (50kΩ each) for DO (+0dB) LED PEAK LEVEL meter reading.

PJ01



8.6 ADJUSTMENT OF COMPU-BIAS (SD720/SD820dbX)

1. **Resetting COMPU-BIAS microprocessor (QQ01)**
   The microprocessor is provided with a HOLD function and it must be reset before making adjustment.
   - How to reset
     a. Short two PRESET pins.
     b. Ground TP06 for about a second, then open it.
     Now QQ01 is reset to the initial state. The data memory of QQ01 is reset to central values. The five-bit signal (00000 to 11111, or 0 to 31 in decimal) output through QQ01 pins ㉘ ~ ㉜ is 10000 (central value) 16) when reset.

NOTE: **Take not that "resetting" the COMPU-BIAS microprocessor differs from "resetting" the COMPU-BIAS keyboard.**

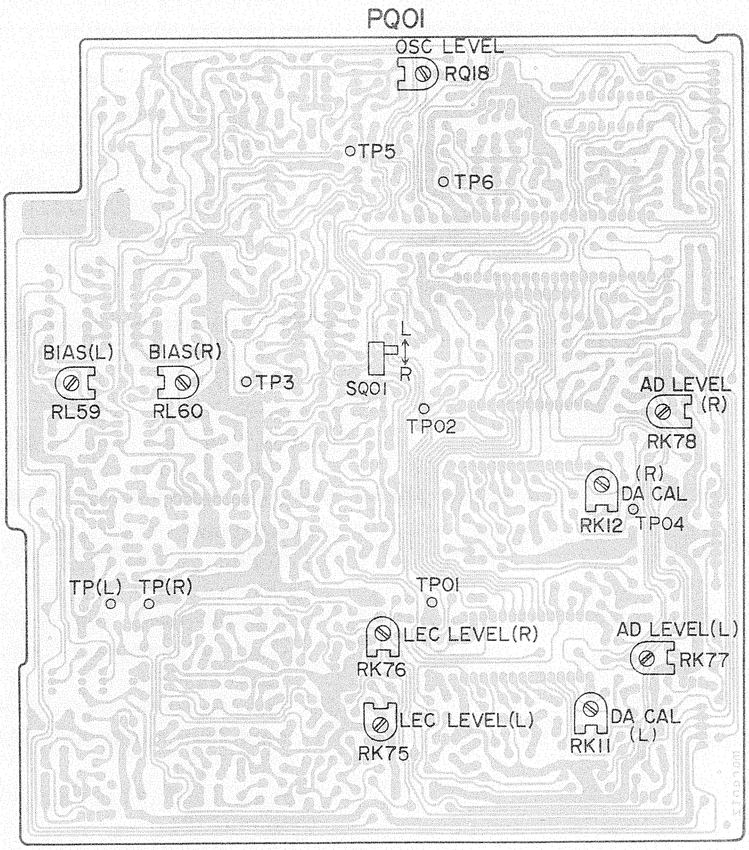
2. Setting reference voltage
   (After resetting the microprocessor)
   a. Adjust RK11 so that the level at TP01 become 0.6 V DC.
   b. Adjust RK12 so that the level at TP02 become 0.6V DC.
3. Adjustment of test signal oscillator output
   a. Connect a VTVM to TP04.
   b. Depress keys "AUTO" and "START" to auto-start COMPU-BIAS. During 6.5 seconds after start (TEST OSC generates 1 kHz), adjust RQ18 so that 12.7 mV develop at TP04. If adjusitment is not completed during that time, depress the RESET key to stop AUTO operation, then auto-start COMPU-BIAS and make adjustment again.
4. Provisional setting of recording bias
   - Reset QQ01.
   - Select NORMAL tape position.

1. Put the deck in REC PAUSE mode and connect a VTVM to TP (L), TP (R), and G-GND
2. Adjust RL59 so that 10 mV AC (bias current: 1 mA) develop at TP (L).
3. Adjust RL60 so that 10 mV AC (bias current: 1 mA) develop at TP (R).
4. Select CrO2 tape position and check that level is 15~16 mV at each of TP (L) and TP (R).
5. Select METAL tape position and check that level is 24~25 mV at each of TP (L) and TP (R).
   (The voltages given are the values developing with reference to GND.)

5. Setting recording bias peak
   - Reset QQ01.
   - Select NORMAL tape position.
   - Tape: AC212.
   - RK75 and RK76: at center
   1. Auto-start the deck and wait until the READY LED lights.
   2. In REC PAUSE mode, check voltage at TP (L) and TP (R) and G-GND.
   3. Reset QQ01.
   4. Put the deck in REC PAUSE mode, and adjust RL59 and RL60 so that the voltages become equal to those observed in step (2).
6. REC level adjustment
   - Input: −60 dB, 1 kHz, MIC Input
   - Tape position: NORMAL
   - Output: LINE OUT
   - Load resistance: 100 kohms
   - Tape: AC212
   - Reset QQ01.
   1. Enter signal through MIC and put the deck in proper drecording mode.
   2. Adjust RK75 (L) and RK76 (R) so that MONITOR OUT and recording/playback output become equal.
7. Setting AC/DC reference voltages
   - Reset QQ01.
   - Input: LINE IN, 1 kHz, 0 VU — 20 dB
   - Tape: AC212
   - SQ01: white side (L/ch)
   1. Connect a digital voltmeter across TP03 (HOT) and G (GND).
   2. Put the deck in REC mode.
   3. Adjust RK77 so that 0.59 V DC develop at TP03.
   4. Set SQ01 to the opposite (non-white) (R/ch) side and adjust RK78 so that 0.59 V DC develop at TP03.
   5. When adjustment is completed, set SQ01 to the white side (L/ch).
      - Be sure to follow the above adjustment procedures (otherwise the COMPU-BIAS might not operate properly).
8. Writing data in FACTORY SET MEMORY
   - Tape: AC212
   - Tape position: NORMAL
   1. Shot two PRESET pins.
   2. Auto-start the deck.
   3. When AUTO operation completes and the READY LED lights, the data set are automatically placed in NORMAL POSITION of FACTORY SET MEMORY.
   4. Perform steps (2) and (3) at each of tape positions CrO2 (AC-512) and METAL (AC-711).
   5. Open the two PRESET pins.

NOTES:

1. **The data written in FACTORY SET MEMORY remain unchanged unless the pins get shorted.**
2. **Be sure to rewrite data in FACTORY SET MEMORY after battery replacement or repair made with wires disconnected from PW boards.**

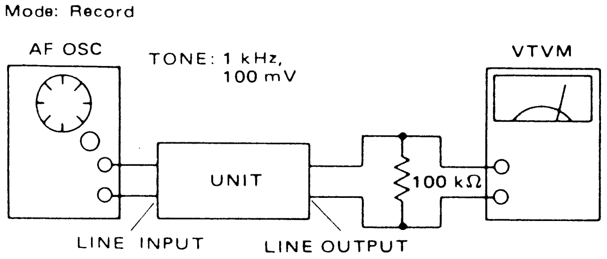


8.7 MPX FILTER ADJUSTMENT

1. Set the TAPE SELECT switch to the NORMAL position.
2. Connect the 1 kHz, 100 mV input signal to the LINE INPUT cord.
3. Set up the deck to the recording state.
4. Adjust the REC LEVEL control for 0 dB meter reading.
5. Adjust the line output level for 0 dB, and turn the DOLBY NR switch to the ON position.
6. Turn the input signal to the 19 kHz.
7. Adjust L601 (L) and L602 (R) in P601 (Dolby NR PWB) for minimum output level.

NOTES:

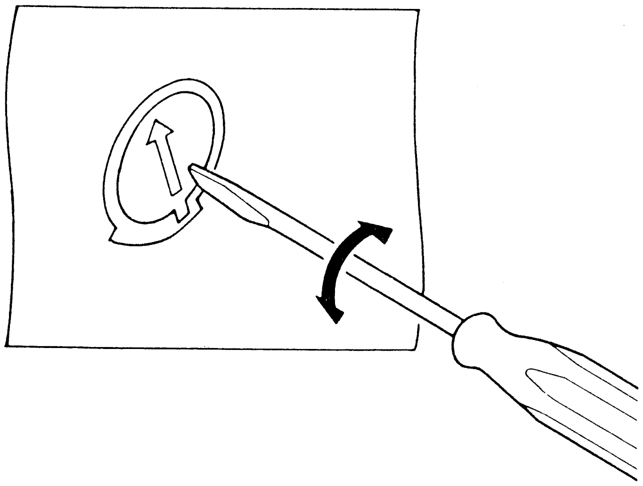
1. **Proceed both for the right and left channels in the same manner.**
2. **If the filter characteristic is better than 30 dB, the MPX filter needs not to be adjusted.**

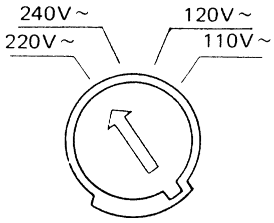

Mode: Record
AF OSC
TONE: 1 kHz,
100 mV
VTVM
UNIT
100 kΩ
LINE INPUT
LINE OUTPUT

9. VOLTAGE CONVERSION

To convert the unit to a different power source voltage, change the position as illustrated in the drawing below.

CAUTION: DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE. DO NOT DISASSEMBLE THE VOLTAGE SELECTOR ABSOLUTELY.





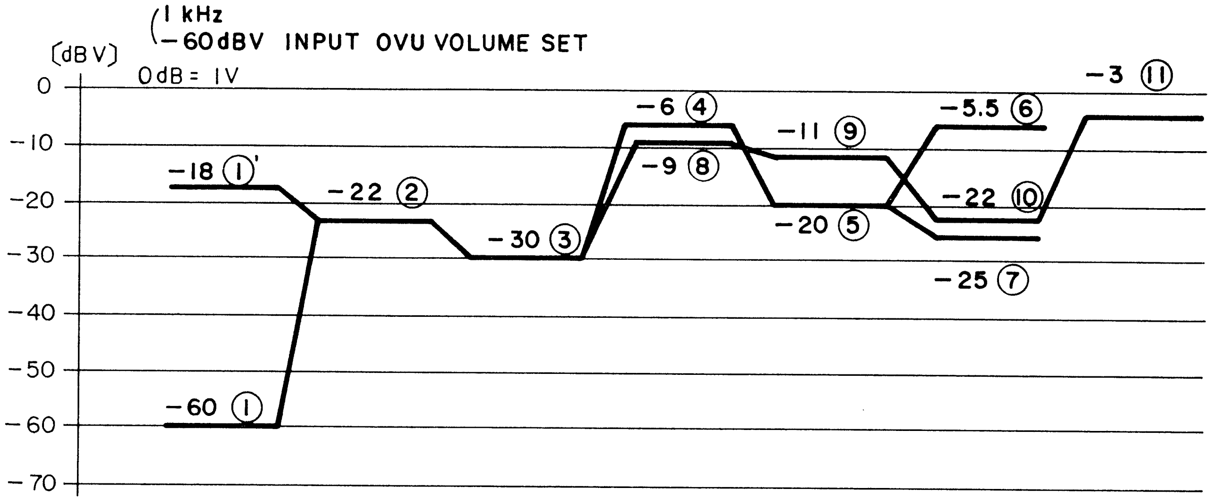
(N.T.A.P) VERSION

NOTE ON SAFETY:
SYMBOL⚠ FIRE OR ELECTRICAL SHOCK HAZARD. ONLY ORIGINAL PARTS SHOULD BE USED TO REPLACE ANY PART MARKED WITH SYMBOL⚠. ANY OTHER COMPONENT SUBSTITUTION (OTHER THAN ORIGINAL TYPE), MAY INCREASE RISK OF FIRE OR ELECTRICAL SHOCK HAZARD.

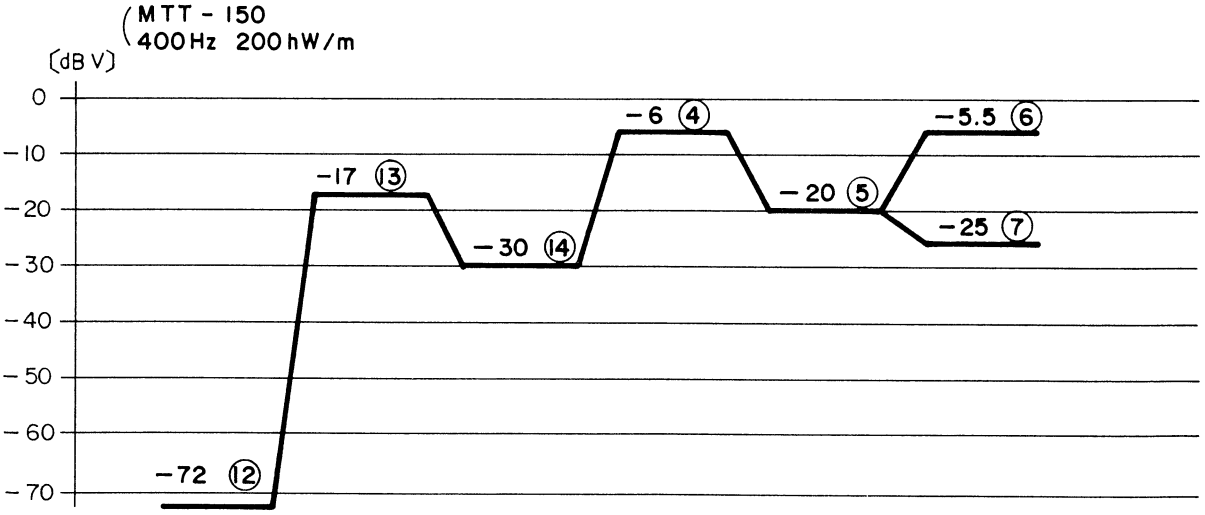
10. DIAGRAMS

10.1 LEVEL DIAGRAM

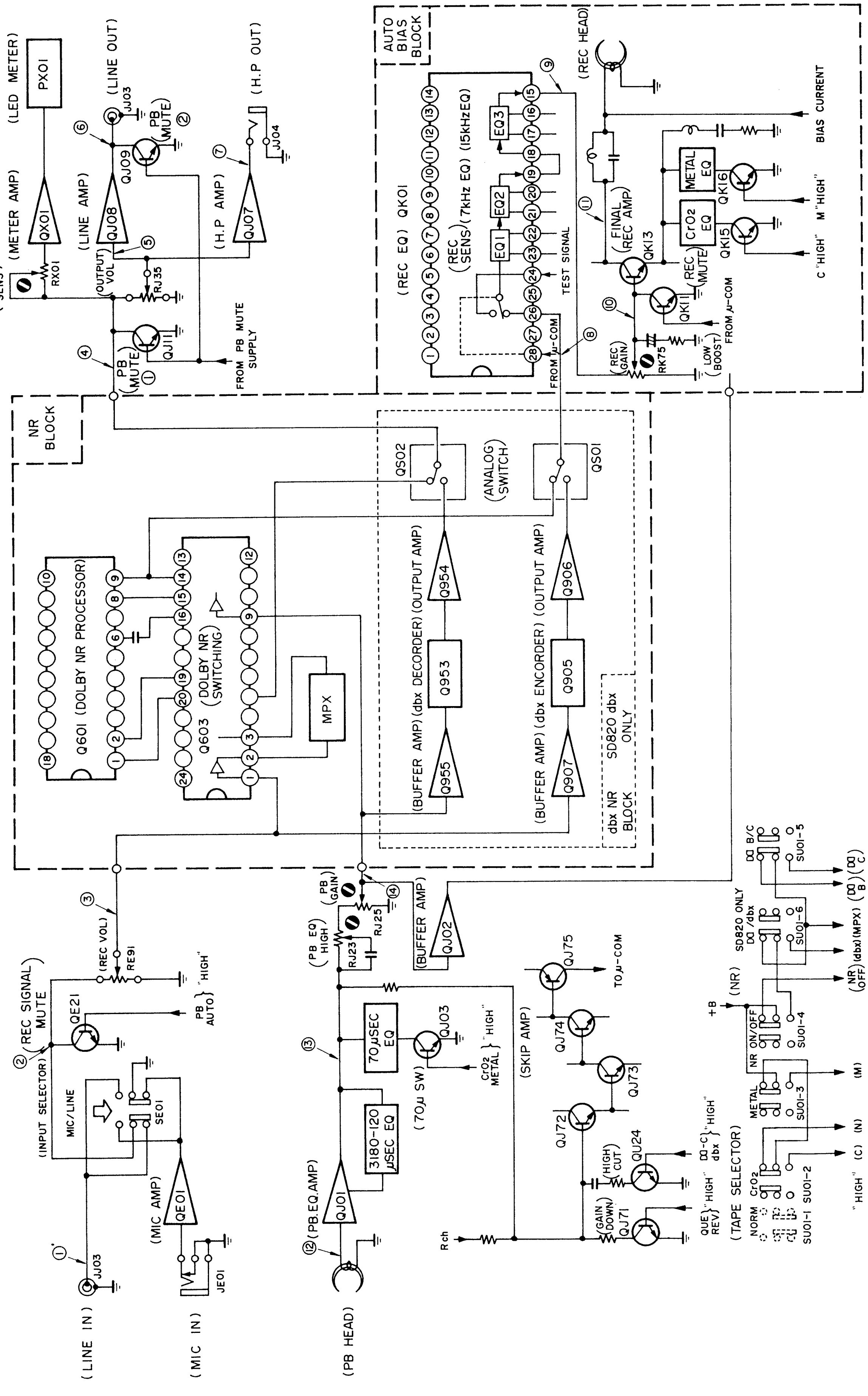
RECORD MODE


(1 kHz
(−60dBV INPUT OVU VOLUME SET

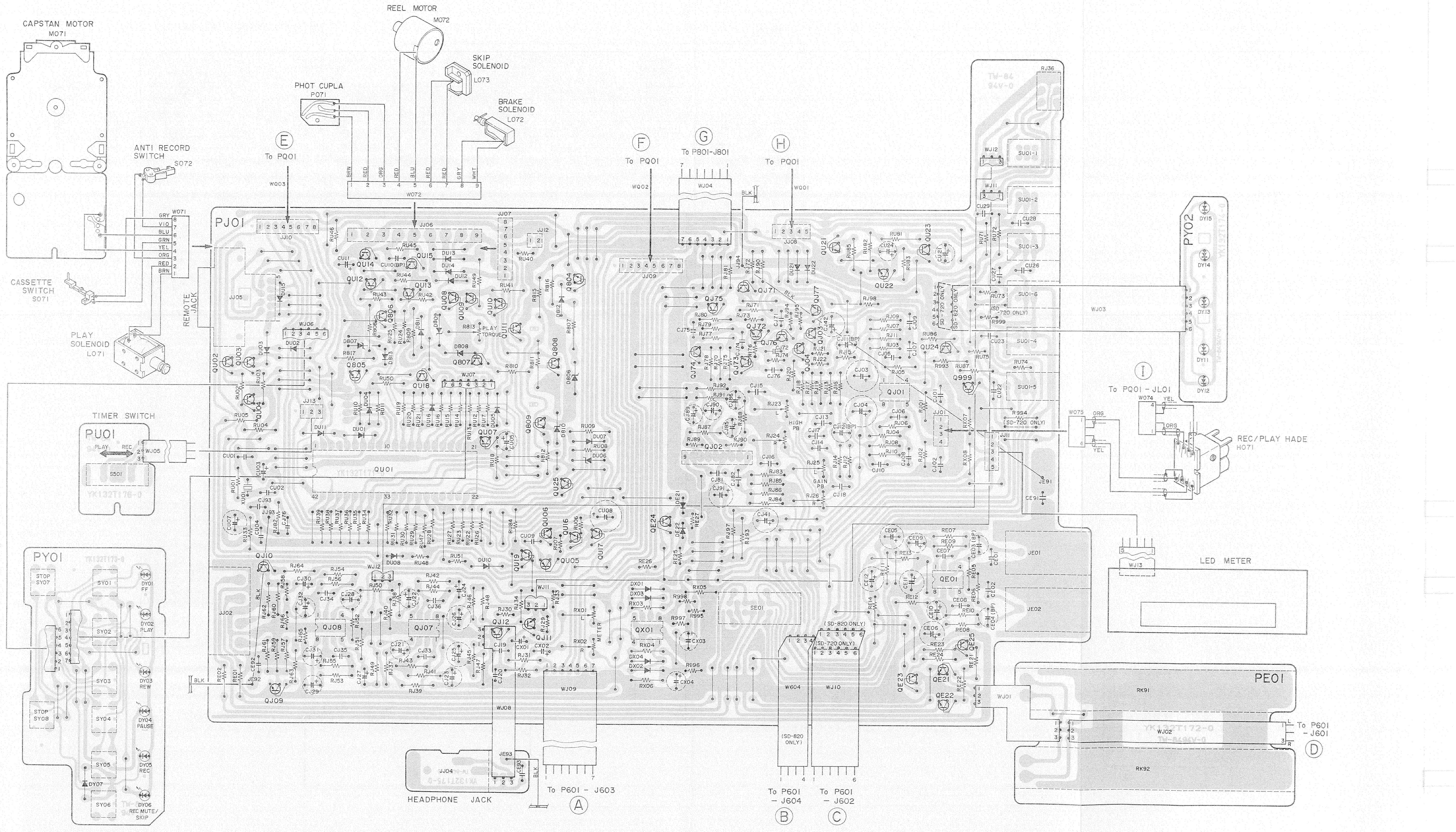
PLAY BACK MODE

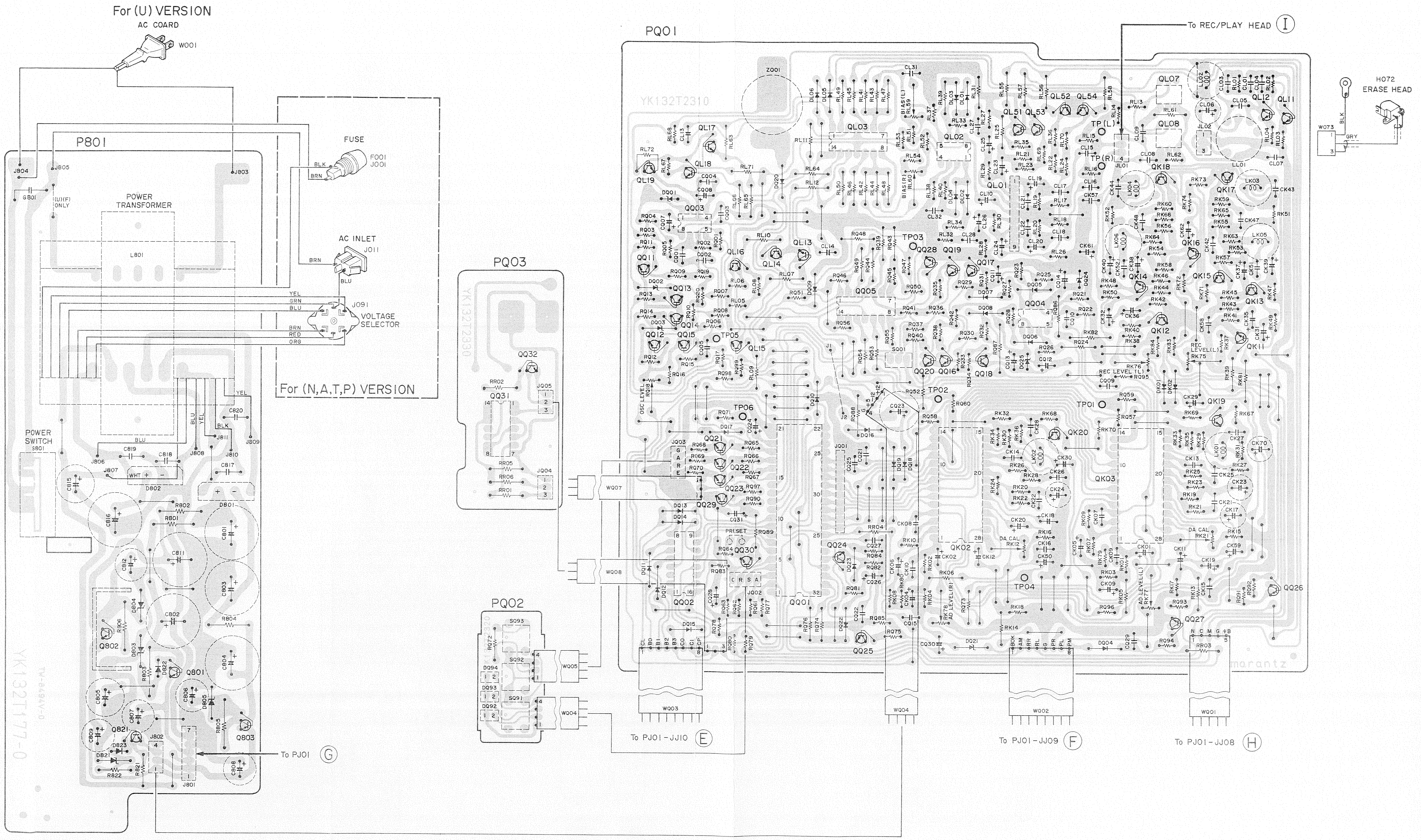

(MTT - 150
(400Hz 200nW/m

10.2 BLOCK DIAGRAM (AUDIO)

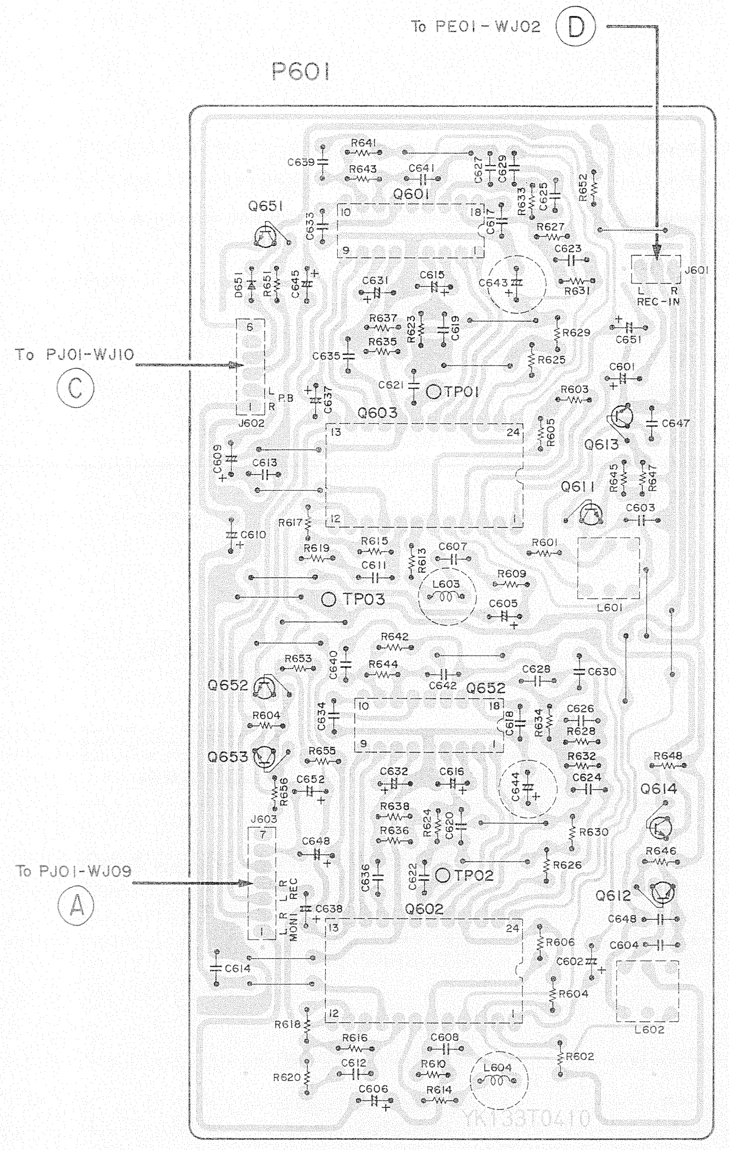

(LINE IN)
(MIC IN)
(PB HEAD)
JJ03
JE01
① ①'
(MIC AMP)
QE01
(INPUT SELECTOR)
MIC/LINE
SE01
② (REC SIGNAL MUTE)
QE21
PB AUTO } "HIGH"
(REC VOL)
RE91
③
NR BLOCK
Q601 (DOLBY NR PROCESSOR)
Q603 (DOLBY NR SWITCHING)
MPX
(BUFFER AMP) (dbx DECORDER) (OUTPUT AMP)
Q955
Q953
Q954
(BUFFER AMP) (dbx ENCORDER) (OUTPUT AMP)
Q907
Q905
Q906
dbx NR BLOCK
SD820 dbx ONLY
(ANALOG SWITCH)
QS02
QS01
④ (PB MUTE ①)
QJ11
FROM PB MUTE SUPPLY
(METER SENS)
RX01
(METER AMP)
QX01
PX01
(LED METER)
(OUTPUT VOL)
RJ35
⑤
(LINE AMP)
QJ08
⑥
QJ09
(PB MUTE ②)
JJ03
(LINE OUT)
(H.P AMP)
QJ07
⑦
JJ04
(H.P OUT)
AUTO BIAS BLOCK
(REC EQ) QK01
(REC SENS) (7kHz EQ) (15kHzEQ)
EQ1
EQ2
EQ3
TEST SIGNAL
FROM μ-COM
⑧
⑨
(REC HEAD)
⑩
(REC GAIN)
RK75
(LOW BOOST)
QK11
(REC MUTE)
FROM μ-COM
QK13
(FINAL REC AMP)
⑪
CrO2 EQ
METAL EQ
QK15
QK16
C "HIGH" M "HIGH"
BIAS CURRENT
⑫ (PB.EQ.AMP)
QJ01
3180-120 μSEC EQ
70μSEC EQ
⑬
(70μ SW)
QJ03
CrO2 METAL } "HIGH"
(PB EQ HIGH)
RJ23
(PB GAIN)
RJ25
⑭
(BUFFER AMP)
QJ02
Rch
(GAIN DOWN)
QJ71
QUE REV } "HIGH"
(HIGH CUT)
QU24
DQ-C dbx } "HIGH"
QJ72
QJ73
QJ74
QJ75
TO μ-COM
(SKIP AMP)
(TAPE SELECTOR)
NORM
CrO2
SU01-1
SU01-2
METAL
SU01-3
NR ON/OFF
SU01-4
+B
(NR)
SD820 ONLY
DQ/dbx
SU01-6
DQ B/C
SU01-5
"HIGH" (C) (N)
(M)
(NR OFF)
(dbx)
(MPX)
(DQ B)
(DQ C)

10.3 WIRING DIAGRAMS

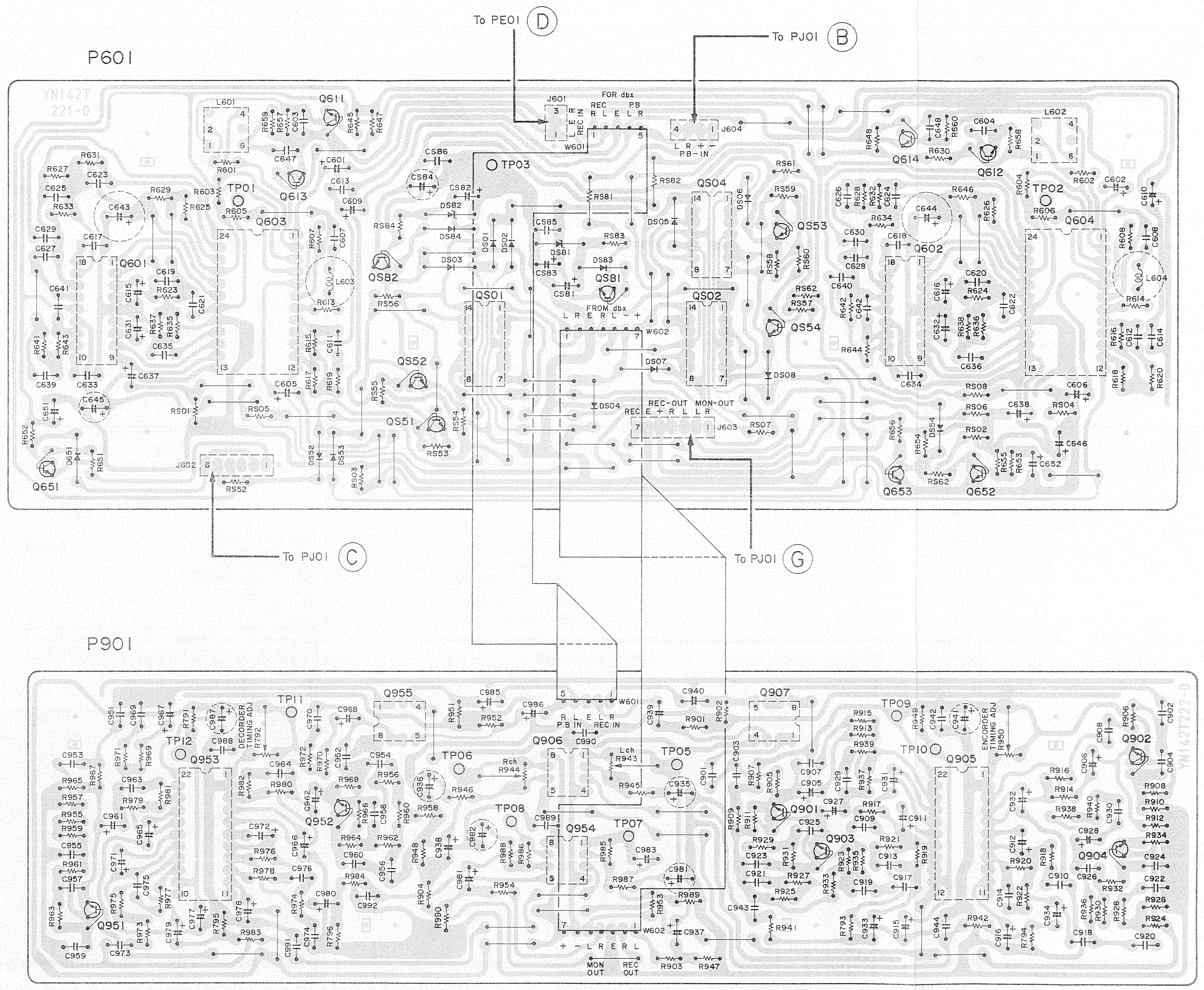

CAPSTAN MOTOR
M071
REEL MOTOR
M072
SKIP SOLENOID
L073
PHOT CUPLA
P071
BRAKE SOLENOID
L072
ANTI RECORD SWITCH
S072
CASSETTE SWITCH
S071
PLAY SOLENOID
L071
REMOTE JACK
TIMER SWITCH
PU01
PLAY
REC
S501
YK132T176-0
PY01
YK132T173-0
STOP SY07
SY01
DY01 FF
SY02
DY02 PLAY
SY03
DY03 REW
STOP SY08
SY04
DY04 PAUSE
SY05
DY05 REC
DY07
SY06
DY06 REC MUTE/ SKIP
PJ01
QU01
YK132T17
E
To PQ01
W003
W072
BRN
RED
ORG
RED
BLU
RED
RED
GRY
WHT
W071
GRY
VIO
BLU
GRN
YEL
ORG
RED
BRN
JJ10
JJ06
JJ07
JJ12
JJ05
JJ09
JJ08
JJ13
JJ02
WJ06
WJ07
WJ04
WJ05
WJ08
WJ09
WJ10
WJ11
WJ12
F
To PQ01
W002
G
To P801-J801
H
To PQ01
W001
BLK
HIGH PB
GAIN PB
SE01
QX01
METER
(SD-820 ONLY)
(SD-720 ONLY)
W604
(SD-820 ONLY)
HEADPHONE JACK
JJ04
YK132T175-0
JE93
CE93
To P601 - J603
A
To P601 - J604
B
To P601 - J602
C
TW-84 94V-0
RJ36
SU01-1
SU01-2
SU01-3
SU01-4
SU01-5
SU01-6
PY02
DY15
DY14
DY13
DY11
DY12
WJ03
(SD-820 ONLY)
(SD-720 ONLY)
I
To PQ01 - JL01
W074
YEL
ORG
W075
REC/PLAY HADE
H071
JE91
CE91
JE01
JE02
QE01
WJ13
LED METER
PE01
RK91
RK92
WJ01
WJ02
YK132T172-0
TW-84 94V-0
To P601 - J601
D


For (U) VERSION
AC COARD
W001
P801
J804
J805
J803
G801
(U)(F) ONLY
POWER TRANSFORMER
L801
FUSE
F001
J001
BLK
BRN
AC INLET
J011
BLU
YEL
GRN
RED
ORG
J091
VOLTAGE SELECTOR
For (N,A,T,P) VERSION
POWER SWITCH
S801
D802
D801
Q802
Q801
Q803
Q821
J802
J801
To PJ01 (G)
YK132T1177-0
PQ03
YK132T2330
QQ31
QQ32
JQ05
JQ04
WQ07
WQ08
PQ02
SQ93
SQ92
SQ91
WQ05
WQ04
PQ01
YK132T2310
Z001
QL03
QL02
QL01
QL07
QL08
QL11
QL12
QL17
QL18
QL19
QQ03
QQ05
QQ04
QK03
QK02
QQ01
QQ02
TP01
TP02
TP03
TP04
TP05
TP06
TP(L)
TP(R)
OSC LEVEL
REC LEVEL (L)
AD LEVEL(L)
AD LEVEL(R)
DA CAL
PRESET
marantz
To REC/PLAY HEAD (I)
H072
ERASE HEAD
W073
GRY
WQ03
WQ04
WQ02
WQ01
To PJ01-JJ10 (E)
To PJ01-JJ09 (F)
To PJ01-JJ08 (H)

SD720

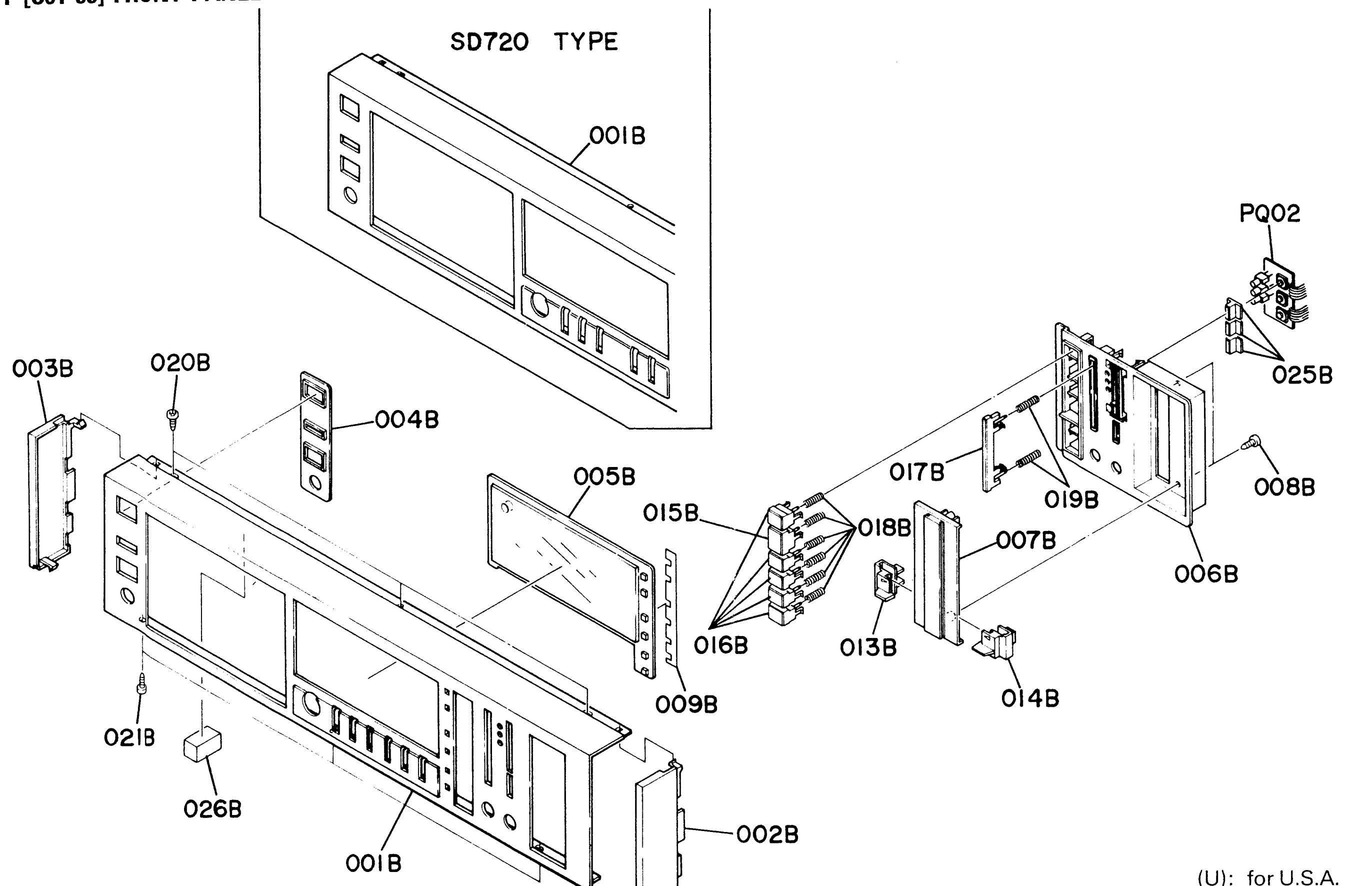

To PE01-WJ02 Ⓓ
P601
To PJ01-WJ10 Ⓒ
To PJ01-WJ09 Ⓐ
YK133T0410

SD820dbx


To PE01 Ⓓ
To PJ01 Ⓑ
P601
YN142T 221-0
To PJ01 Ⓒ
To PJ01 Ⓖ
P901
YN142T222-0

11. EXPLODED VIEWS AND PARTS LIST

11.1 [C01-99] FRONT PANEL

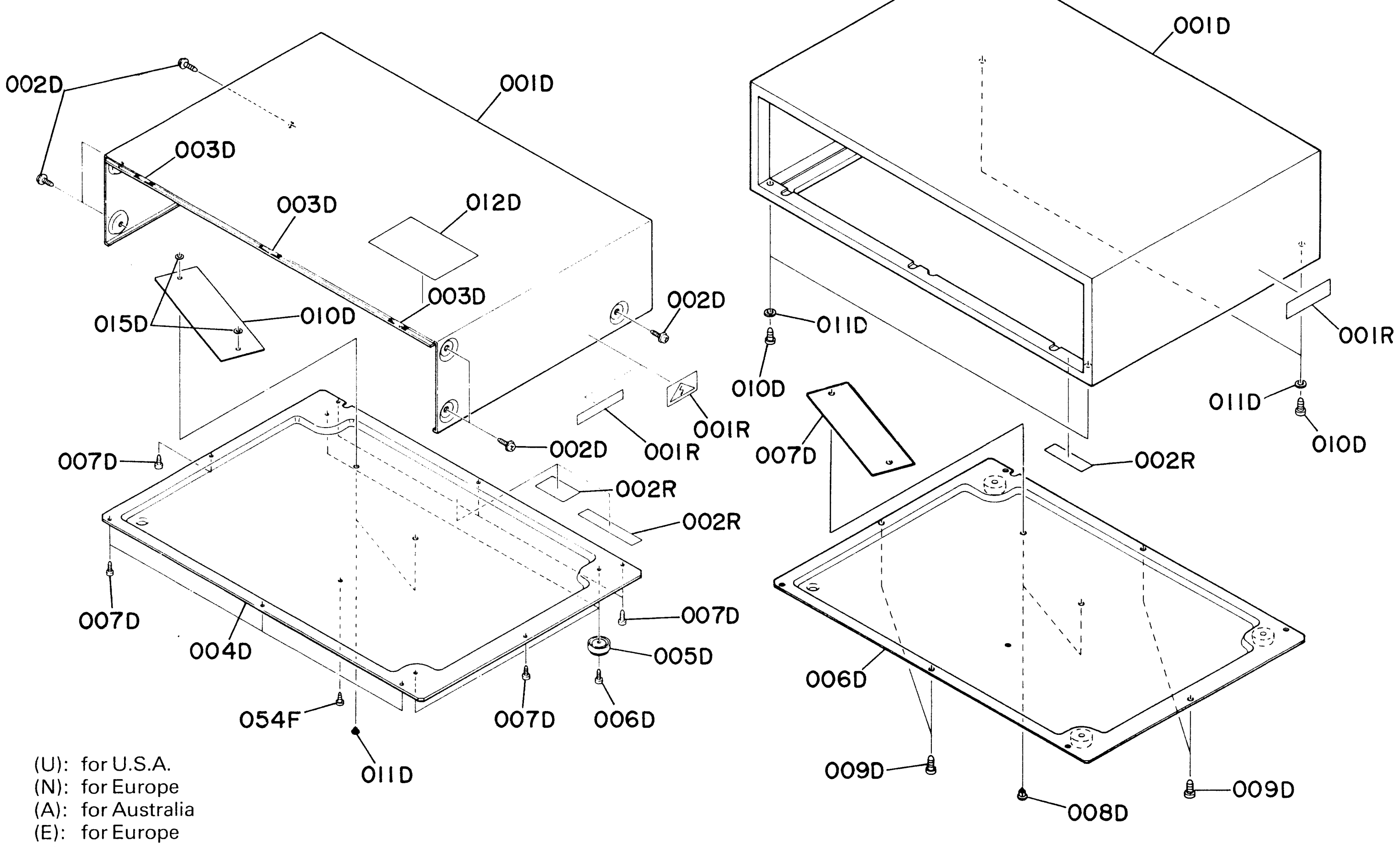


(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	N	A	P		
						(SD720)
A	1	1	1		132T063400	Front Panel Assembly
A1				1	132T063410	Front Panel Assembly
001B	1	1	1	1	132T063010	Escutcheon, Front panel
002B	1	1	1		229H067010	Cap, (Right)
003B	1	1	1		229H067020	Cap, (Left)
004B	1	1	1	1	128T259010	Bushing, Power Switch
005B	1	1	1	1	128T158030	Window, Meter
006B	1	1	1	1	128T259020	Bushing, Operation
007B	1	1	1	1	129T265020	Indicator, Rec Volume
008B	2	2	2	2	51500308B0	F.H. Taptite Screw F3 x 8
009B	1	1	1	1	128T122010	Sticker
013B	1	1	1	1	129T154010	Knob, Rec (Left)
014B	1	1	1	1	129T154020	Knob, Rec (Right)
015B	1	1	1	1	416H154020	Knob, Play
016B	5	5	5	5	420H154010	Knob, Mecha Operation
017B	1	1	1	1	128T154030	Knob, Stop
018B	6	6	6	6	416H115010	Spring, Mecha Knob
019B	2	2	2	2	132T115010	Spring, Stop Knob
020B	3	3	3	3	51280306B0	B.H. Tapped Screw B3 x 6
021B	3	3	3	3	51280306B0	B.H. Tapped Screw B3 x 6
025B	3	3	3	3	132T154010	Knob, Auto Bias
026B	1	1	1	1	128T114010	Stopper, Cassette

REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	P		
				(SD820dbx)
A	1		142T063400	Front Panel Assembly
A1		1	142T063410	Front Panel Assembly
001B	1	1	142T063010	Escutcheon, Front Panel
002B	1		229H067010	Cap, (Right)
003B	1		229H067020	Cap, (Left)
004B	1	1	128T259010	Bushing, Power Switch
005B	1	1	128T158030	Window, Meter
006B	1	1	128T259020	Bushing, Operation
007B	1	1	129T265020	Indicator, Rec Volume
008B	2	2	51500308B0	F.H. Taptite Screw F3 x 8
009B	1	1	128T122010	Sticker
013B	1	1	129T154010	Knob, Rec (Left)
014B	1	1	129T154020	Knob, Rec (Right)
015B	1	1	416H154020	Knob, Play
016B	5	5	420H154010	Knob, Mecha Operation
017B	1	1	128T154030	Knob, Stop
018B	6	6	416H115010	Spring, Mecha Knob
019B	2	2	132T115010	Spring, Stop Knob
020B	3	3	51280306B0	B.H. Tapped Screw B3 x 6
021B	3	3	51280306B0	B.H. Tapped Screw B3 x 6
025B	3	3	132T154010	Knob, Auto Bias
026B	1	1	128T114010	Stopper, Cassette

11.2 [C02-99] LID (TOP & BOTTOM COVER)

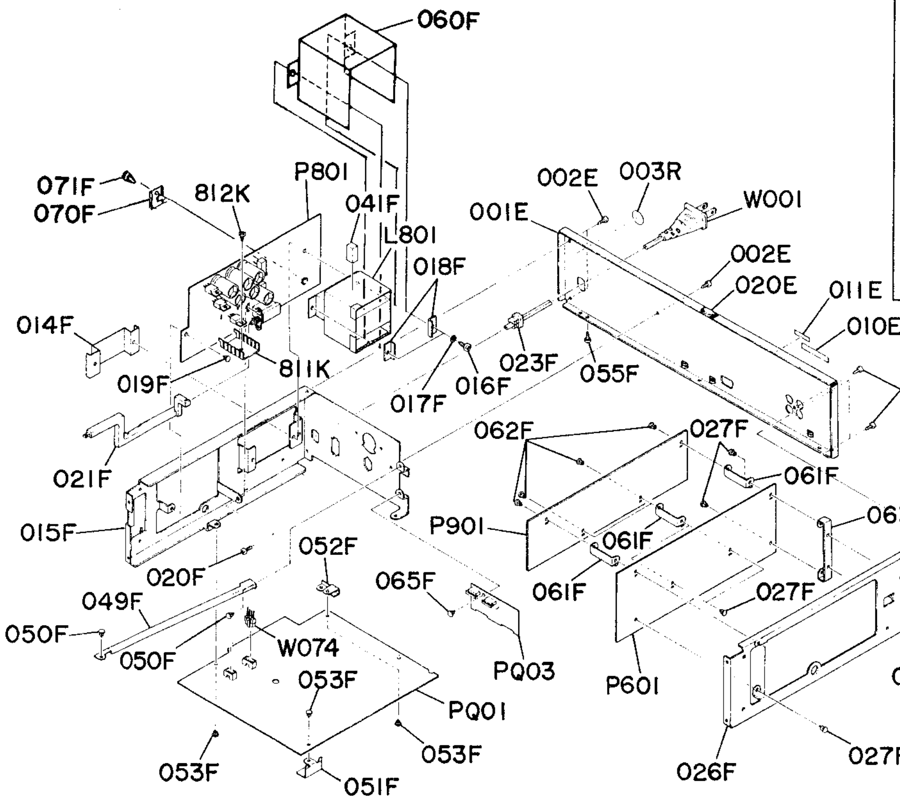


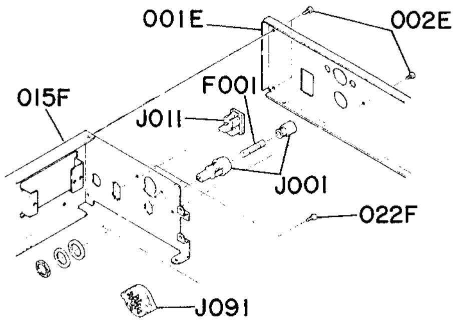
(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
001D	1	1	1	1		128T257020	Lid, Top Cover
001D					1	132T064500	Case Assembly, Wood
002D	6					51260408Z0	B.T. Screw B4 x 8
002D		6	6	6		51260408U0	B.T. Screw B4 x 8
003D	3	3	3	3		200C056060	Buffer
004D	1	1	1	1		128T257010	Lid, Bottom Cover
005D	3	3	3	3		416H057010	Leg
006D	3	3	3	3		51280408B0	B.H. Tapped Screw B4 x 8
006D					1	128T257010	Lid, Bottom Cover
007D	8	8	8	8		51280308B0	B.H. Tapped Screw B3 x 8
007D					1	136T109010	Shield
008D					2	2276005050	Clamper
009D					4	51280308B0	B.H. Tapped Screw B3 x 8
010D	1	1	1	1		136T109010	Shield

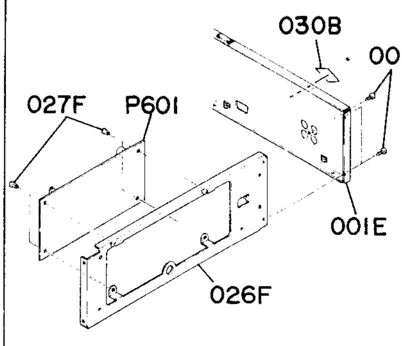
REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
010D					4	51280320B0	B.H. Tapped Screw B3 x 20
011D	2	2	2	2		2276005050	Clamper
011D					4	54110149A0	Flat Washer, L.
012D	1					128T107010	Sheet
015D	2	2	2	2		59030810P0	Washer
001R	2					117H861010	Label
001R		1	1	1		2932861110	Label
001R					1	2932861010	Label
002R		1	1	1	1	2578861010	Label
054F	1	1	1	1	1	51100308A9	B.H.M. Screw B3 x 8

11.3 [C03-99] REAR PANEL


060F
071F
070F
812K
P801
041F
L801
018F
002E
003R
001E
W001
002E
020E
011E
010E
014F
019F
811K
017F
016F
023F
055F
002E
021F
062F
027F
061F
015F
P901
061F
063F
052F
020F
065F
061F
027F
049F
050F
050F
W074
053F
PQ03
P601
064F
PQ01
053F
053F
051F
026F
027F


001E
002E
015F
F001
J011
J001
022F
J091

(N,A,E,P) TYPE


030B
002E
027F
P601
001E
026F

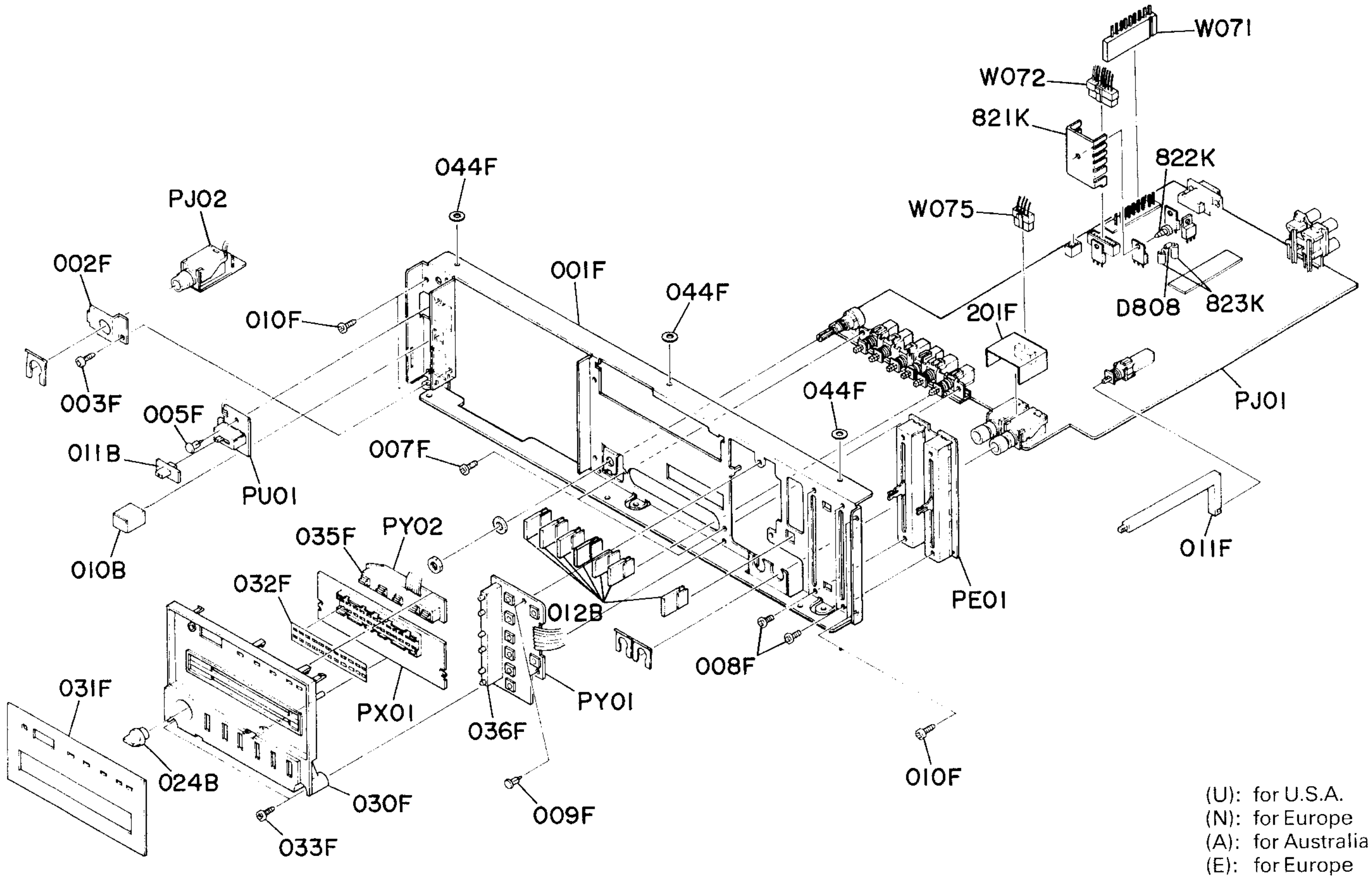
(N,A,E,P) TYPE

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
001E	1					132T160230	Bracket, Rear Panel
001E		1	1		1	132T160210	Bracket, (SD720)
001E				1	1	142T160220	Bracket, (SD820dbx)
002E	6	6	6	6	6	51280308B0	B.H. Tapped Screw B3 x 8
010E	1	1	1	1	1	2112265010	Indicator
011E		1	1	1	1	4581861010	Label, Made in Japan
020E	1	1	1	1	1	103H056020	Buffer
014F	1	1	1	1	1	132T160030	Bracket
015F	1	1	1	1	1	128T160090	Bracket, Power Supply
016F	2	2	2	2	2	51280412B0	B.H. Tapped Screw B4 x 12
017F	2	2	2	2	2	54040402N0	Spring Washer
018F	2	2	2	2	2	4265005010	Clamper
019F	1	1	1	1	1	2276005050	Clamper
020F	1	1	1	1	1	51100306A9	B.H.M. Screw B3 x 6
021F	1	1	1	1	1	128T121010	Link, Power Switch
022F		2	2	2	2	51280310B0	B.H. Tapped Screw B3 x 10
023F	1					1455249030	Bushing
026F				1	1	128T160130	Bracket, (SD820dbx)
026F	1	1	1		1	128T160030	Bracket, (SD720)
027F	4	4	4	4	4	2276005050	Clamper
041F	1	1	1	1	1	3435056040	Buffer
049F	1	1	1	1	1	132T101020	Support
050F	2	2	2	2	2	2276005050	Clamper
051F	1	1	1	1	1	132T160010	Bracket
052F	1	1	1	1	1	132T160020	Bracket
053F	4	4	4	4	4	2276005050	Clamper
055F	1	1	1	1	1	51280306B0	B.H. Tapped Screw B3 x 6
070F	1	1	1	1	1	142T120010	Insulator
071F	1	1	1	1	1	2276005050	Clamper

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
061F				4	4	142T160010	Bracket (SD820dbx)
062F				4	4	2276005050	Clamper (SD820dbx)
063F				1	1	142T160020	Bracket (SD820dbx)
064F				2	2	51280306B0	B.H. Tapped Screw B3 x 6 (SD820dbx)
065F	1	1	1	1	1	2276005050	Clamper
811K	1	1	1	1	1	202H276030	Heatsink
812K	1	1	1	1	1	51280306B0	B.H. Tapped Screw B3 x 6
003R	1					9511101070	Label, UL
⚠F001		1	1	1		FS10025800	Fuse T250mA
⚠F001					1	FS10050800	Fuse T500mA
⚠J001		1	1	1	1	YJ08000290	Jack, Fuse Holder
⚠J011		1	1	1	1	YP04000580	Plug, AC Inlet
⚠J091		1	1	1	1	BY05080050	Voltage Selector
⚠W001	1					YC01900070	A.C. Power Cord
⚠L801	1					TS15715090	Power Transformer
⚠L801		1	1	1	1	TS15716040	Power Transformer
W074	1	1	1	1	1	YB00201100	Connective Cord
030B					1	2918861010	Label (SD720)
060F	1	1	1	1	1	128T109020	Shield

11.4 [P01-99] FRONT CHASSIS

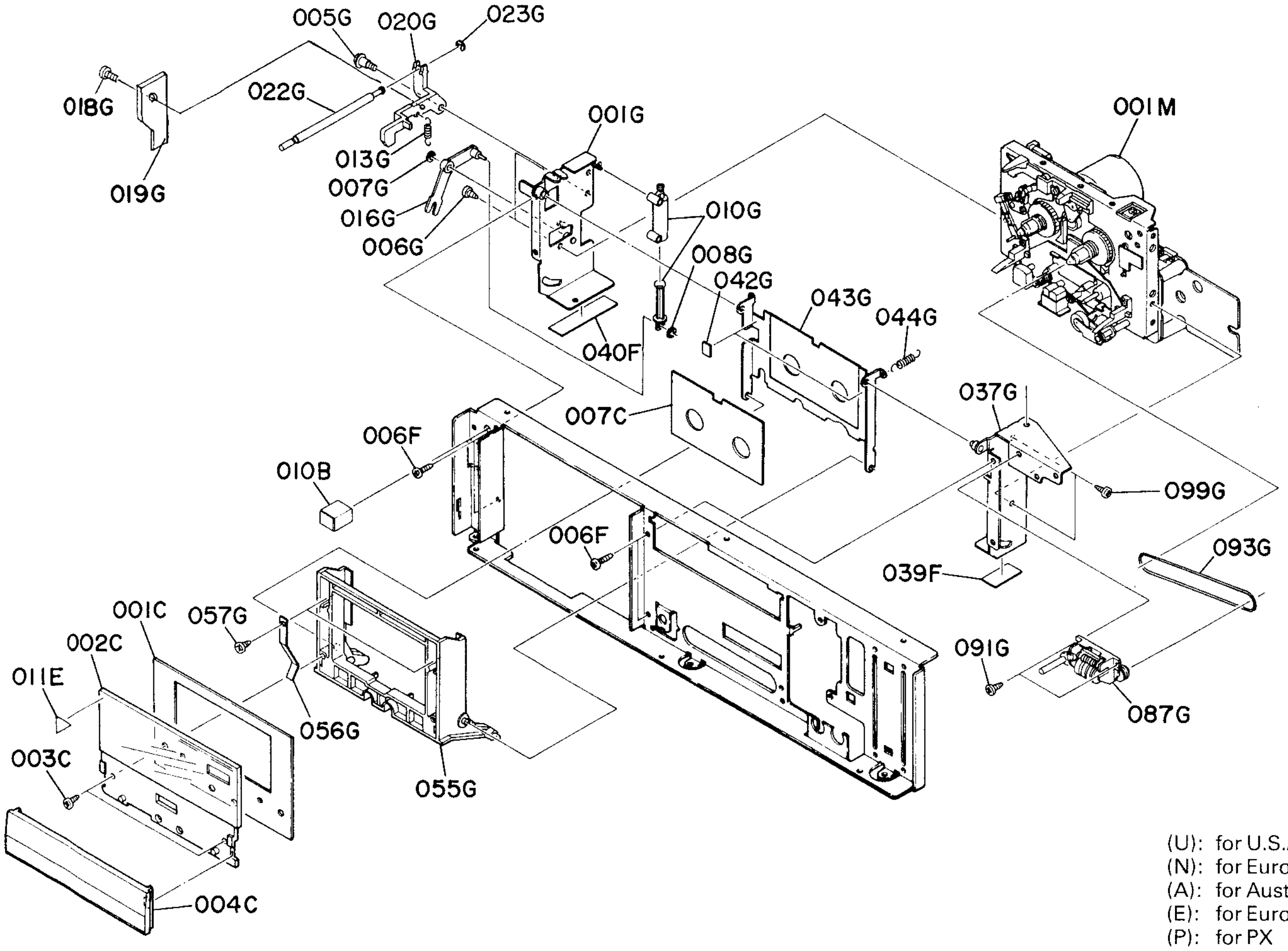

W071
W072
821K
822K
044F
PJ02
W075
002F
001F
044F
010F
201F
D808
823K
003F
005F
044F
PJ01
011B
007F
PU01
035F
PY02
011F
010B
032F
012B
PE01
008F
031F
PY01
PX01
036F
024B
010F
030F
009F
033F

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY U	N	A	E	P	PART NO.	DESCRIPTION
010B	1	1	1	1	1	415H154010	Knob, Power
011B	1	1	1	1	1	128T154020	Knob, Timer
012B				7	7	128T154010	Knob, Mode SW. (SD820dbx)
012B	6	6	6		6	128T154010	Knob, Mode SW. (SD720)
024B	1	1	1	1	1	124T154010	Knob, Fine Bias
001F	1	1	1	1	1	128T160010	Bracket, Front Chassis
002F	1	1	1	1	1	128T160080	Bracket, Phone Jack
003F	1	1	1	1	1	51300306B0	P.H. Tapped Screw P3 x 6
005F	1	1	1	1	1	2276005050	Clamper
007F	2	2	2	2	2	51100306A9	B.H.M. Screw B3 x 6
008F	4	4	4	4	4	51100306A9	B.H.M. Screw B3 x 6
009F	2	2	2	2	2	2276005050	Clamper
010F	4	4	4	4	4	51280306B0	B.H.Tapped Screw B3 x 6
011F	1	1	1	1	1	128T121020	Link, Input Select
030F	1	1	1	1	1	128T271020	Holder, LED Meter
044F	3	3	3	3	3	59051208P0	Washer

REF. DESIG.	Q'TY U	N	A	E	P	PART NO.	DESCRIPTION
031F	1	1	1	1	1	128T302010	Dial
032F	1	1	1	1	1	102T303010	Mask
033F	2	2	2	2	2	51280308B0	B.H. Tapped Screw B3 x 8
035F	1	1	1	1	1	128T271030	Holder, Mode LED
036F	1	1	1	1	1	128T271040	Holder, Mode LED
201F	1	1	1	1	1	128T109010	Shield, Mic Jack
821K	1	1	1	1	1	202H267030	Heatsink
822K	1	1	1	1	1	51280306B0	B.H. Tapped Screw B3 x 6
823K	1	1	1	1	1	2933118010	Spacer, For D808
W071	1	1	1	1	1	YB00420070	Connective Cord
W072	1	1	1	1	1	YJ06001070	Jack
W075	1	1	1	1	1	YM00250160	Connective Cord
PX01	1	1	1	1	1	HI11203320	L.E.D. Meter, LT1008

11.5 [P02-99] ASSOCIATED MECHANISM FOR CASSETTE TAPE OPERATION

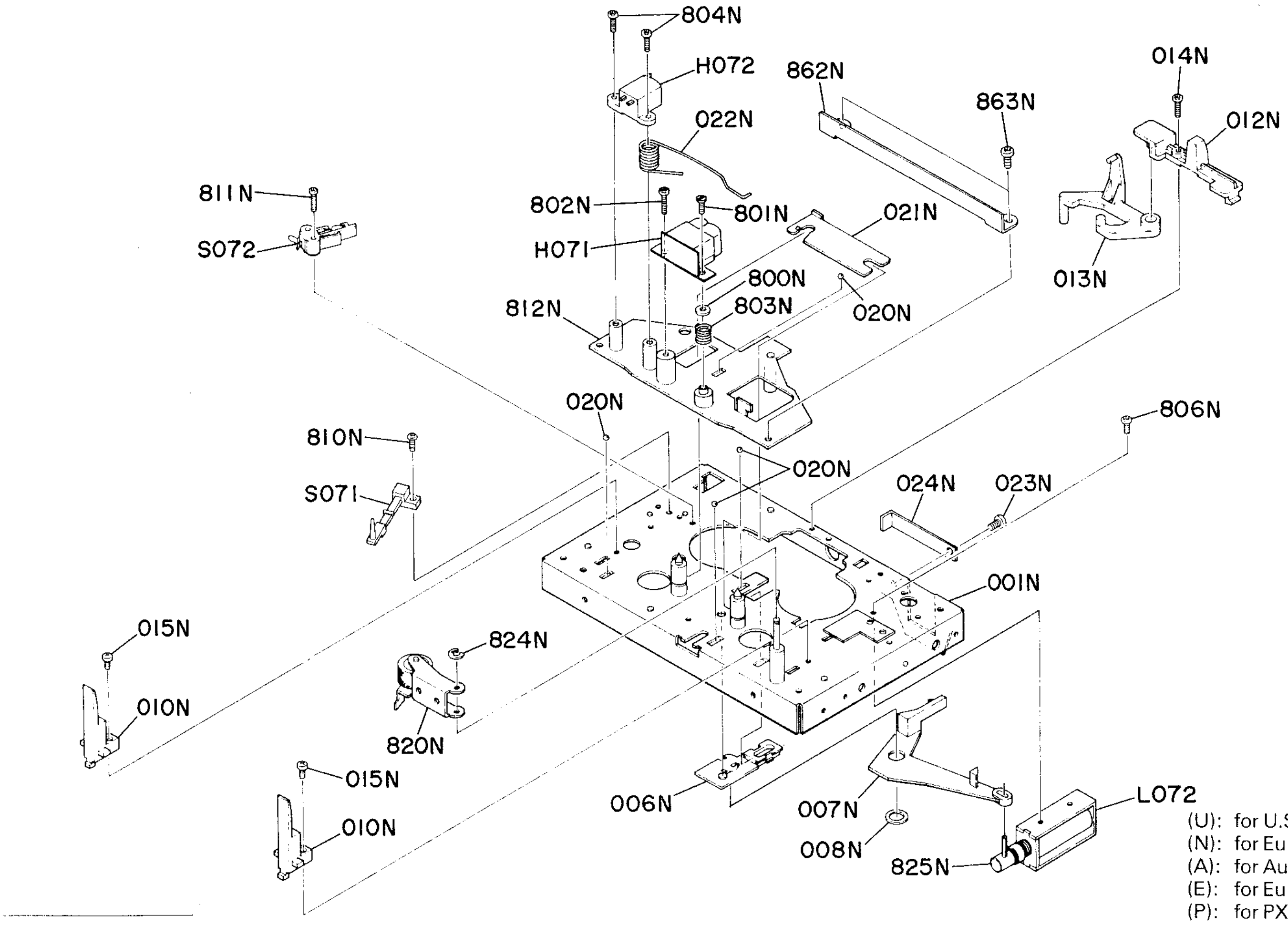

005G
020G
023G
018G
022G
001G
001M
019G
013G
007G
016G
006G
010G
008G
042G
043G
044G
040F
037G
007C
006F
010B
099G
006F
093G
039F
001C
057G
002C
091G
011E
056G
087G
003C
055G
004C

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
010B	1	1	1	1	1	415H154010	Knob, Eject
001C	1	1	1	1	1	128T063020	Escutcheon, Cassette Lid
002C	1	1	1	1	1	128T158020	Window
003C	2	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6
004C				1	1	142T053010	Cover (SD820dbx)
004C	1	1	1			128T053030	Cover (SD720),
007C	1	1	1	1	1	128T274010	Reflector
011E	1					113T861010	Label
006F	4	4	4	4	4	51300306B0	P.H. Tapped Screw P3 x 6
039F	1	1	1	1	1	201H118010	Spacer
040F	1	1	1	1	1	2965118010	Spacer
001G	1	1	1	1	1	128T160520	Bracket, K (Left)
005G	1	1	1	1	1	4367112150	Shaft
006G	2	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6
007G	1	1	1	1	1	307Y114020	Stopper, Dumper Arm
008G	1	1	1	1	1	64020200Q0	RG Ring, CS Type
010G	1	1	1	1	1	128T276010	Piston, Dumper
013G	1	1	1	1	1	4367115240	Spring, Eject Arm
016G	1	1	1	1	1	128T121030	Link, Dumper
020G	1	1	1	1	1	128T002040	Arm, Eject
022G	1	1	1	1	1	128T254020	Pin, Eject
019G	1	1	1	1	1	132T354010	Lever
018G	1	1	1	1	1	51302605B0	P.H. Tapped Screw P2.6 x 5

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
023G	1	1	1	1	1	128T114020	Stopper, Eject Pin
037G	1	1	1	1	1	128T160530	Bracket, K (Right)
042G	2	2	2	2	2	307Y056020	Buffer
043G	1	1	1	1	1	128T104020	Retainer, Cassette Door
044G	1	1	1	1	1	128T115080	Spring, Door Open
055G	1	1	1	1	1	128T271050	Holder, Cassette
056G	2	2	2	2	2	128T115010	Spring
057G	2	2	2	2	2	51282605B0	B.H. Tapped Screw B2.6 x 5
087G	1	1	1	1	1	129T052500	Counter, K
091G	2	2	2	2	2	51282606B0	B.H. Tapped Screw B2.6 x 6
093G	1	1	1	1	1	120T264010	Belt, Counter
099G	2	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6
001M	1	1	1	1	1	313Y304030	Mechanism Assembly

11.6 [P03-99] PARTS ASSEMBLED ON TOP OF CHASSIS

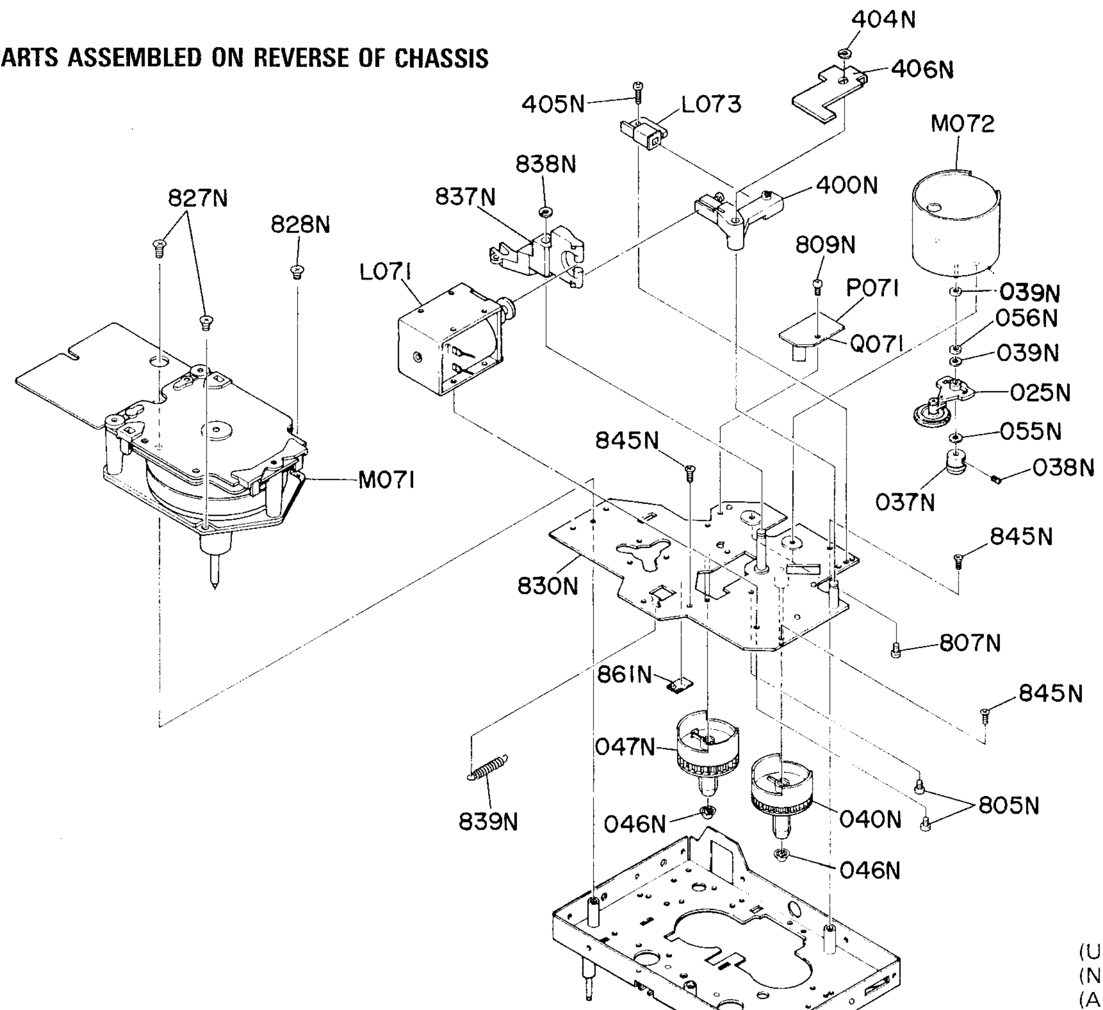

804N
H072
862N
863N
014N
012N
022N
811N
S072
802N
801N
021N
H071
800N
013N
812N
803N
020N
020N
810N
020N
806N
S071
024N
023N
001N
015N
824N
010N
820N
015N
006N
007N
L072
010N
008N
825N

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
001N	1	1	1	1	1	313Y105400	Chassis Assembly
006N	1	1	1	1	1	313Y160010	Bracket, Brake
007N	1	1	1	1	1	313Y002030	Arm, Brake
008N	1	1	1	1	1	59050802G9	Washer
010N	2	2	2	2	2	313Y104020	Retainer, Guide
012N	1	1	1	1	1	313Y104030	Retainer, Guide
013N	1	1	1	1	1	313Y002050	Arm, Rec Safty
014N	1	1	1	1	1	51062608A0	P.H.M. Screw P2.6 x 8
015N	2	2	2	2	2	51062606A0	P.H.M. Screw P2.6 x 6
020N	4	4	4	4	4	61025010T0	Ball ϕ2.5
021N	1	1	1	1	1	313Y115010	Spring
022N	1	1	1	1	1	313Y115070	Spring, Pinch Roller
023N	1	1	1	1	1	51300406B0	P.H. Tapped Screw P4 x 6
024N	1	1	1	1	1	313Y114010	Stopper
800N	1	1	1	1	1	313Y055010	Collar
801N	1	1	1	1	1	51100204A0	B.H.M. Screw B2 x 4
802N	1	1	1	1	1	51190207A2	P.H.M. Screw P2 x 7
803N	1	1	1	1	1	4380115090	Spring, Azimuth
804N	2	2	2	2	2	51100206A0	B.H.M. Screw B2 x 6
806N	1	1	1	1	1	51442604A0	L. Washer Screw M2.6 x 4
810N	1	1	1	1	1	51062604A0	P.H.M. Screw P2.6 x 4
811N	1	1	1	1	1	51100208A0	B.H.M. Screw B2 x 8
812N	1	1	1	1	1	313Y105430	Chassis Assembly, Head

REF. DESIG.	Q'TY					PART NO.	DESCIPTION
	U	N	A	E	P		
820N	1	1	1	1	1	313Y002400	Arm Assembly, Pinch Roller
824N	1	1	1	1	1	64002500R0	RG Ring, E Type
825N	1	1	1	1	1	313Y115060	Spring, Brake Solenoid
862N	1	1	1	1	1	313Y271010	Holder
863N	2	2	2	2	2	51102603A0	B.H.M. Screw B2.6 x 3
H071	1	1	1	1	1	LH82132020	Head, Rec/Play
H072	1	1	1	1	1	LH31000580	Head, Erase
⚠L072	1	1	1	1	1	ME10440010	Solenoid Coil, Brake
S071	1	1	1	1	1	SM01010740	Mini Switch, Cassette
S072	1	1	1	1	1	SM01010950	Mini Switch, Rec Safty

11.7 [P04-99] PARTS ASSEMBLED ON REVERSE OF CHASSIS

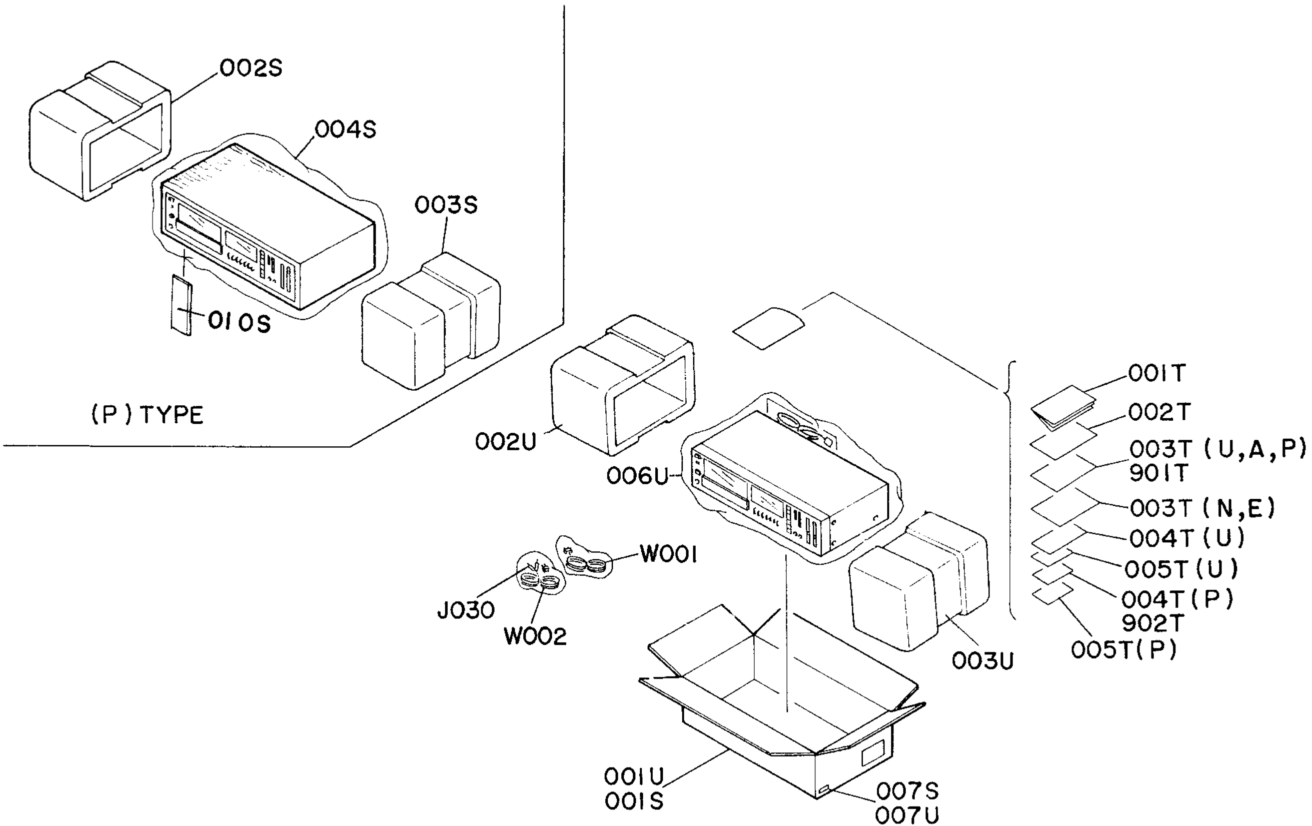

404N
406N
405N
L073
M072
838N
400N
827N
837N
828N
809N
L071
P071
039N
056N
Q071
039N
025N
055N
845N
038N
M071
037N
845N
830N
807N
861N
845N
047N
805N
839N
046N
040N
046N

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
025N	1	1	1	1	1	313Y002530	Arm Assembly, F/R
037N	1	1	1	1	1	313Y262050	Pulley, F/R
038N	1	1	1	1	1	51692603Q0	Socket Screw, HP M2.6 x 3
039N	2	2	2	2	2	59020405G9	Washer
040N	1	1	1	1	1	313Y004510	Supply Reel
046N	2	2	2	2	2	4367067010	Cap, Reel
047N	1	1	1	1	1	313Y004520	Take-up Reel
055N	1	1	1	1	1	59020805G9	Washer
056N	1	1	1	1	1	313Y118010	Spacer
400N	1	1	1	1	1	313Y002410	Arm Assembly, Skip
406N	1	1	1	1	1	313Y002090	Arm Interlock
404N	1	1	1	1	1	307Y114020	Stopper
405N	1	1	1	1	1	51060206A0	P.H.M. Screw P2 x 6
805N	1	1	1	1	1	51060304A9	P.H.M. Screw P3 x 4
807N	2	2	2	2	2	51062603A0	P.H.M. Screw P2.6 x 3
809N	1	1	1	1	1	51572604A0	P. Taptite Screw P2.6 x 4
827N	2	2	2	2	2	51042606A0	F.H.M. Screw F2.6 x 6
828N	1	1	1	1	1	51042604A0	F.H.M. Screw F2.6 x 4
830N	1	1	1	1	1	313Y105420	Chassis Assembly, Sub
837N	1	1	1	1	1	313Y002040	Arm, Play
838N	1	1	1	1	1	307Y114020	Stopper
839N	1	1	1	1	1	313Y115050	Spring
845N	3	3	3	3	3	51042606A0	F.H.M. Screw F2.6 x 6
861N	1	1	1	1	1	313Y118040	Spacer

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
⚠L071	1	1	1	1	1	ME10490030	Solenoid Coil, Paly
⚠L073	1	1	1	1	1	ME00140030	Solenoid Coil, Skip
⚠M071	1	2	1	1	1	MM11500020	D.C. Motor, DD
⚠M072	1	1	1	1	1	MM00900010	D.C. Motor, F/R
P071	1	1	1	1	1	YH313Y0210	P.W. Board, Photo Unit
Q071	1	1	1	1	1	HW10001030	Photo Unit

11.8 [H01-99] PACKING MATERIALS



(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY U	N	A	E	P	PART NO.	DESCRIPTION
001S					1	142T801020	Packing Case (SD820dbx)
001S					1	132T801060	Packing Case (SD720)
002S					1	125H809010	Cushion, (L)
003S					1	125H809010	Cushion, (R)
004S					1	9090808030	Polyethylene Sheet
007S					2	9526019050	Serial No. Card
010S					1	142T118010	Spacer
001T	1					132T851210	Instructions
001T		1	1	1	1	132T851310	Instructions
002T	1					132T851220	Instructions
002T		1	1		1	132T851320	Instructions, (SD720)
002T				1	1	142T851320	Instructions, (SD820dbx)
003T	1					103H854010	Guarantee Card
003T		1				132T856010	Circuit Diagram (SD720)
003T				1		142T856010	Circuit Diagram (SD820dbx)
003T			1			9631000090	Guarantee Card
003T					1	2818854010	Guarantee Card
004T	1					2225813010	Envelope
004T					1	9650000010	S. Station Card
005T	1					9560000100	Hang Tag
005T					1	3435851210	Instruction
901T	1					2818854040	Guarantee Card (Canada)
902T	1					9650000050	S.Station Card (Canade)

REF. DESIG.	Q'TY U	N	A	E	P	PART NO.	DESCRIPTION
001U	1					132T801020	Packing Case
001U		1	1	1		132T801010	Packing Case (SD720)
001U				1		142T801010	Packing Case (SD820dbx)
002U	1	1	1	1		229H809010	Cushion (L)
003U	1	1	1	1		229H809020	Cushion (R)
004U	1					2918107370	Sheet
006U	1	1	1	1		9090808030	Polyethylene Sheet
007U	2					9526019010	Serial No. Card
007U		4		4		9526019060	Serial No. Card
007U			4			9526019030	Serial No. Card
J030					1	YJ04000240	Jack, Adaptor
⚠W001		1		1		ZC01805010	A.C. Power Cord
⚠W001			1			ZC02006020	A.C. Power Cord
⚠W001					1	ZC01807010	A.C. Power Cord
W002	2	2	2	2	2	ZD01000170	Connective Cord

11.9 ELECTRICAL PARTS LIST

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
							P601-DOLBY B-C NR CIRCUIT BOARD (SD820 dbx, ONLY)
P601				1	1	YN142T2210	P.W. Board, Dolby B-C NR
				1	1	ZZ142T2210	P.W. Board Asssbbly
							(SD720, ONLY)
P601	1	1	1		1	YK133T0410	P.W. Board, Dolby B-C NR
	1	1	1		1	ZZ133T0410	P.W. Board Assembly
							P601-CAPACITORS
CS81				1	1	EA10602530	Elect 10µF 25V
CS82				1	1	EA10602530	Elect 10µF 25V
CS83				1	1	EA47601030	Elect 47µF 10V
CS84				1	1	EA47601030	Elect 47µF 10V
CS85				1	1	DK18103300	Ceramic 0.01µF
CS86				1	1	DK18103300	Ceramic 0.01µF
C601	1	1	1	1	1	EA10505030	Elect 1µF 50V
C602	1	1	1	1	1	EA10505030	Elect 1µF 50V
C603	1	1	1	1	1	DF15332300	Film 3300pF ±5%
C604	1	1	1	1	1	DF15332300	Film 3300pF ±5%
C605	1	1	1	1	1	EA10602530	Elect 10µF 25V
C606	1	1	1	1	1	EA10602530	Elect 10µF 25V
C607	1	1	1	1	1	DF15182300	Film 1800pF ±5%
C608	1	1	1	1	1	DF15182300	Film 1800pF ±5%
C609	1	1	1	1	1	EA10505030	Elect 1µF 50V
C610	1	1	1	1	1	EA10505030	Elect 1µF 50V
C611	1	1	1	1	1	DF15103350	Film 0.01µF ±5%
C612	1	1	1	1	1	DF15103350	Film 0.01µF ±5%
C613	1	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C614	1	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C615	1	1	1	1	1	EA10602530	Elect 10µF 25V
C616	1	1	1	1	1	EA10602530	Elect 10µF 25V
C617	1	1	1	1	1	DF15473350	Film 0.047µF ±5%
C618	1	1	1	1	1	DF15473350	Film 0.047µF ±5%
C619	1	1	1	1	1	DF15472300	Film 4700pF ±5%
C620	1	1	1	1	1	DF15472300	Film 4700pF ±5%
C621	1	1	1	1	1	DF15333350	Film 0.033µF ±5%
C622	1	1	1	1	1	DF15333350	Film 0.033µF ±5%
C623	1	1	1	1	1	DF15683350	Film 0.068µF ±5%
C624	1	1	1	1	1	DF15683350	Film 0.068µF ±5%
C625	1	1	1	1	1	DF15333350	Film 0.033µF ±5%
C626	1	1	1	1	1	DF15333350	Film 0.033µF ±5%
C627	1	1	1	1	1	DF15104350	Film 0.1µF ±5%
C628	1	1	1	1	1	DF15104350	Film 0.1µF ±5%
C629	1	1	1	1	1	DF15154350	Film 0.15µF ±5%
C630	1	1	1	1	1	DF15154350	Film 0.15µF ±5%
C631	1	1	1	1	1	EA10602530	Elect 10µF 25V
C632	1	1	1	1	1	EA10602530	Elect 10µF 25V
C633	1	1	1	1	1	DF15224350	Film 0.22µF ±5%
C634	1	1	1	1	1	DF15224350	Film 0.22µF ±5%
C635	1	1	1	1	1	DF15472300	Film 4700pF ±5%
C636	1	1	1	1	1	DF15472300	Film 4700pF ±5%
C637	1	1	1	1	1	EA10602530	Elect 10µF 25V
C638	1	1	1	1	1	EA10602530	Elect 10µF 25V
C639	1	1	1	1	1	DF15333350	Film 0.033µF ±5%
C640	1	1	1	1	1	DF15333350	Film 0.033µF ±5%

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
C641	1	1	1	1	1	DF15104350	Film 0.1µF ±5%
C642	1	1	1	1	1	DF15104350	Film 0.1µF ±5%
C643	1	1	1	1	1	EA47701630	Elect 470µF 16V
C644	1	1	1	1	1	EA47701630	Elect 470µF 16V
C645	1	1	1	1	1	EA22602530	Elect 22µF 25V
C646	1	1	1	1	1	EA22602530	Elect 22µF 25V
C647	1	1	1	1	1	DF15272300	Film 2700pF ±5%
C648	1	1	1	1	1	DF15272300	Film 2700pF ±5%
C651	1	1	1	1	1	EA10602530	Elect 10µF 25V
C652	1	1	1	1	1	EA10505030	Elect 1µF 50V
							P601-RESISTORS (All Resistors are ±5% & ¼W)
RS01				1	1	GD05563140	56kΩ
RS02				1	1	GD05563140	56kΩ
RS03				1	1	GD05563140	56kΩ
RS04				1	1	GD05563140	56kΩ
RS05				1	1	GD05272140	2.7kΩ
RS06				1	1	GD05272140	2.7kΩ
RS07				1	1	GD05122140	1.2kΩ
RS08				1	1	GD05122140	1.2kΩ
RS52				1	1	GD05823140	82kΩ
RS53				1	1	GD05823140	82kΩ
RS54				1	1	GD05823140	82kΩ
RS55				1	1	GD05154140	150kΩ
RS56				1	1	GD05823140	82kΩ
RS57				1	1	GD05823140	82kΩ
RS58				1	1	GD05823140	82kΩ
RS59				1	1	GD05823140	82kΩ
RS60				1	1	GD05154140	150kΩ
RS61				1	1	GD05823140	82kΩ
RS62				1	1	GD05823140	82kΩ
⚠RS81				1	1	NF02100140	10Ω, Fuse
⚠RS82				1	1	NF02100140	10Ω, Fuse
RS83				1	1	GD05271140	270Ω
RS84				1	1	GD05271140	270Ω
RP11	1	1	1		1	RC00000140	0Ω
R601	1	1	1	1	1	GD05242140	2.4kΩ
R602	1	1	1	1	1	GD05242140	2.4kΩ
R603	1	1	1	1	1	GD05562140	5.6kΩ
R604	1	1	1	1	1	GD05562140	5.6kΩ
R605	1	1	1	1	1	GD05123140	12kΩ
R606	1	1	1	1	1	GD05123140	12kΩ
R607				1	1	GD05472140	4.7kΩ
R608				1	1	GD05472140	4.7kΩ
R609	1	1	1		1	GD05472140	4.7kΩ
R610	1	1	1		1	GD05472140	4.7kΩ
R613	1	1	1	1	1	GD05102140	1kΩ
R614	1	1	1	1	1	GD05102140	1kΩ
R615	1	1	1	1	1	GD05683140	68kΩ
R616	1	1	1	1	1	GD05683140	68kΩ
R617	1	1	1	1	1	GD05222140	2.2kΩ
R618	1	1	1	1	1	GD05222140	2.2kΩ
R619	1	1	1	1	1	GD05512140	5.1kΩ
R620	1	1	1	1	1	GD05512140	5.1kΩ
R623	1	1	1	1	1	GD05473140	47kΩ
R624	1	1	1	1	1	GD05473140	47kΩ

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION	
	U	N	A	E	P			
R625	1	1	1	1	1	GD05472140	4.7kΩ	
R626	1	1	1	1	1	GD05472140	4.7kΩ	
R627	1	1	1	1	1	GD05334140	330kΩ	
R628	1	1	1	1	1	GD05334140	330kΩ	
R629	1	1	1	1	1	GD05123140	12kΩ	
R630	1	1	1	1	1	GD05123140	12kΩ	
R631	1	1	1	1	1	GD05823140	82kΩ	
R632	1	1	1	1	1	GD05823140	82kΩ	
R633	1	1	1	1	1	GD05394140	390kΩ	
R634	1	1	1	1	1	GD05394140	390kΩ	
R635	1	1	1	1	1	GD05154140	150kΩ	
R636	1	1	1	1	1	GD05154140	150kΩ	
R637	1	1	1	1	1	GD05154140	150kΩ	
R638	1	1	1	1	1	GD05154140	150kΩ	
R641	1	1	1	1	1	GD05334140	330kΩ	
R642	1	1	1	1	1	GD05334140	330kΩ	
R643	1	1	1	1	1	GD05394140	390kΩ	
R644	1	1	1	1	1	GD05394140	390kΩ	
R645	1	1	1	1	1	GD05103140	10kΩ	
R646	1	1	1	1	1	GD05103140	10kΩ	
R647	1	1	1	1	1	GD05103140	10kΩ	
R648	1	1	1	1	1	GD05103140	10kΩ	
R651	1	1	1	1	1	GD05223140	22kΩ	
R652	1	1	1	1	1	GD05332140	3.3kΩ	
R653	1	1	1	1	1	GD05823140	82kΩ	
R654				1	1	GD05103140	10kΩ	
R654	1	1	1		1	GD05223140	22kΩ	
R655	1	1	1	1	1	GD05183140	18kΩ	
R656	1	1	1	1	1	GD05392140	3.9kΩ	
R657	1	1	1	1	1	GD05105140	1MΩ	
R658	1	1	1	1	1	GD05105140	1MΩ	
R659	1	1	1	1	1	GD05105140	1MΩ	
R660	1	1	1	1	1	GD05105140	1MΩ	
							P601-SEMICONDUCTIOR	
DS01 ≀ DS08				8	8	HD20001000	Diode	1S1555
DS52				1	1	HD20001000	Diode	1S1555
DS53				1	1	HD20001000	Diode	1S1555
DS54				1	1	HD20001000	Diode	1S1555
DS81				1	1	HD30029090	Zener	WZ-090
DS82				1	1	HD30029090	Zener	WZ-090
DS83				1	1	HD20001000	Diode	1S1555
DS84				1	1	HD20001000	Diode	1S1555
D651	1	1	1	1	1	HD20001000	Diode	1S1555
QS01				1	1	HC406600B0	IC Quad Bilateral SW.	
QS02				1	1	HC406600B0	IC Quad Bilateral SW.	
QS04				1	1	HC406600B0	IC Quad Bilateral SW.	
QS51				1	1	HT107332A0	Transistor	2SA733(P or Q)
QS52				1	1	HT326342A0	Transistor	2SC2634(R or S)
QS53				1	1	HT107332A0	Transistor	2SA733(P or Q)
QS54				1	1	HT326342B0	Transistor	2SC2634(R or S)
QS81				1	1	HT313832C0	Transistor	2SC1383(R or S)
QS82				1	1	HT106832C0	Transistor	2SA683(R or S)

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION	
	U	N	A	E	P			
Q601	1	1	1	1	1	HC10012270	IC	NE652
Q602	1	1	1	1	1	HC10012270	IC	NE652
Q603	1	1	1	1	1	HC10013270	IC	NE654
Q604	1	1	1	1	1	HC10013270	IC	NE654
Q611	1	1	1	1	1	HT326342A0	Transistor	2SC2634 (R or S
Q612	1	1	1	1	1	HT326342A0	Transistor	2SC2634 (R or S
Q613	1	1	1	1	1	HT326342A0	Transistor	2SC2634 (R or S
Q614	1	1	1	1	1	HT326342A0	Transistor	2SC2634 (R or S
Q651	1	1	1	1	1	HT326342A0	Transistor	2SC2634 (R or S
Q652	1	1	1	1	1	HT326342A0	Transistor	2SC2634 (R or S
Q653	1	1	1	1	1	HT326342A0	Transistor	2SC2634 (R or S
							P601-MISCELLANEOUS	
J601	1	1	1	1	1	YJ06002430	Jack, (3P)	
J602	1	1	1	1	1	YJ06002450	Jack, (6P)	
J603	1	1	1	1	1	YJ06002460	Jack, (7P)	
J604				1	1	YJ06002440	Jack, (4P)	
L601	1	1	1	1	1	LS10440050	M.P.X. Coil	
L602	1	1	1	1	1	LS10440050	M.P.X. Coil	
L603	1	1	1	1	1	LC23660600	Choke Coil, 36mH	
L604	1	1	1	1	1	LC23660600	Choke Coil, 36mH	
W601				1	1	YU05180260	Jumper Lead, (5P)	
W602				1	1	YU07080260	Jumper Lead, (7P)	
W604				1	1	YU04180260	Jumper Lead, (4P)	
							P801-POWER SUPPLY CIRCUIT BOARD (SD820dbx, ONLY)	
P801				1	1	YK132T1770	P.W. Board, Power Supply	
				1	1	ZZ132T8770	P.W. Board Assembly	
							(SD720, ONLY)	
P801	1	1	1		1	YK132T1770	P.W. Board, Power Supply	
	1					ZZ132T1770	P.W. Board Assembly	
		1	1		1	ZZ132T8770	P.W. Board Assembly	
							P801-CAPACITORS	
⚠C801	1	1	1	1	1	EA10803530	Elect	1000μF 35V
⚠C802	1	1	1	1	1	EA10803530	Elect	1000μF 35V
⚠C803	1	1	1	1	1	EA10803530	Elect	1000μF 35V
⚠C804	1	1	1	1	1	EA10803530	Elect	1000μF 35V
⚠C805	1	1	1	1	1	EA47702530	Elect	470μF 25V
⚠C806	1	1	1	1	1	EA47701630	Elect	470μF 16V
⚠C807	1	1	1	1	1	EA22702530	Elect	220μF 25V
⚠C808	1	1	1	1	1	EA22701630	Elect	220μF 16V
⚠C809	1	1	1	1	1	EA22701630	Elect	220μF 16V
⚠C811	1	1	1	1	1	EA10803530	Elect	1000μF 35V
⚠C812	1	1	1	1	1	EA47701630	Elect	470μF 16V
⚠C815	1	1	1	1	1	EA10801630	Elect	1000μF 16V
⚠C816	1	1	1	1	1	EA33802530	Elect	3300μF 25V
⚠C817	1	1	1	1	1	DK18103560	Ceramic	0.01μF
⚠C818	1	1	1	1	1	DK18103560	Ceramic	0.01μF
⚠C819	1	1	1	1	1	DK18103560	Ceramic	0.01μF
⚠C820	1	1	1	1	1	DK18103560	Ceramic	0.01μF
⚠G801	1					DK18103530	Ceramic	0.01μF 125V
⚠G801		1	1	1	1	DK18103540	Ceramic	0.01μF 400V

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
							P801-RESISTORS
⚠R801	1	1	1	1	1	RF05047120	4.7Ω ±5% ½W, Fusible
R802	1	1	1	1	1	RF05047120	4.7Ω ±5% ½W, Fusible
⚠R803	1	1	1	1	1	GA05471010	470Ω ±5% 1W
⚠R804	1	1	1	1	1	RF05068120	6.8Ω ±5% ½W, Fusible
⚠R805	1	1	1	1	1	GA05681010	680Ω ±5% 1W
R806	1	1	1	1	1	GA05561010	560Ω ±5% 1W
⚠R815	1	1	1	1	1	RF05022120	2.2kΩ ±5% ½W, Fusible
⚠R816	1	1	1	1	1	RF05056120	5.6Ω ±5% ½W, Fusible
⚠R817	1	1	1	1	1	RF05056140	5.6Ω ±5% ¼W, Fusible
⚠R821	1	1	1	1	1	NF02100140	10Ω ±2% ¼W, Fuse
⚠R822	1	1	1	1	1	GD05102140	1kΩ ±5% ¼W
							P801-SEMICONDUCTORS
⚠D801	1	1	1	1	1	HD20027080	Diode RB-152
⚠D802	1	1	1	1	1	HD20027080	Diode RB-152
⚠D803	1	1	1	1	1	HD30030090	Zener WA-177
⚠D804	1	1	1	1	1	HD30024090	Zener WZ-120
⚠D805	1	1	1	1	1	HD30024090	Zener WA-120
⚠D821	1	1	1	1	1	HD30021020	Zener MA1068M
⚠Q801	1	1	1	1	1	HT403131E0	Transistor 2SD313(E)
⚠Q802	1	1	1	1	1	HT403131E0	Transistor 2SD313(E)
⚠Q803	1	1	1	1	1	HT205071E0	Transistor 2SB507(E)
⚠Q821	1	1	1	1	1	HT313832C0	Transistor 2SC1383 (R or S)
⚠D822	1	1	1	1	1	HD20001000	Diode 1S1555
⚠D823	1	1	1	1	1	HD20001000	Diode 1S1555
							P801-MISCELLANEOUS
J801	1	1	1	1	1	YJ06002460	Jack, (7P)
J802	1	1	1	1	1	YJ06002440	Jack, (4P)
J803	1					YL01010040	Terminal
J804	1					YL01010040	Terminal
⚠L801	1					TS15715090	Power Transformer
⚠L801		1	1	1	1	TS10716040	Power Transformer
⚠S801	1					SP01010610	Push Switch, Power
⚠S801		1	1	1	1	SP01010600	Push Switch, Power
							P901-DBX CIRCUIT BOARD (SD820dbx, ONLY)
P901				1	1	YK142T2220	P.W. Board, DBX
				1	1	ZZ142T2220	P.W. Board Assembly
C901				1	1	DF15334350	Film 0.33μF ±5%
C902				1	1	DF15334350	Film 0.33μF ±5%
C903				1	1	DF15334350	Film 0.33μF ±5%
C904				1	1	DF15334350	Film 0.33μF ±5%
C905				1	1	EA10505030	Elect 1μF 50V
C906				1	1	EA10505030	Elect 1μF 50V
C907				1	1	DF15223350	Film 0.022μF ±5%
C908				1	1	DF15223350	Film 0.022μF ±5%
C909				1	1	DF15472300	Film 4700pF ±5%
C910				1	1	DF15472300	Film 4700pF ±5%
C911				1	1	EV22600360	Elect 22μF 3.15V
C912				1	1	EV22600360	Elect 22μF 3.15V
C913				1	1	DF15331550	Film 330pF ±5%
C914				1	1	DF15331550	Film 330pF ±5%
C915				1	1	EA10602530	Elect 10μF 25V
C916				1	1	EA10602530	Elect 10μF 25V
C917				1	1	DF15104350	Film 0.1μF ±5%
C918				1	1	DF15104350	Film 0.1μF ±5%
C919				1	1	DF15104350	Film 0.1μF ±5%
C920				1	1	DF10104350	Film 0.1μF ±5%
C921				1	1	DF15332300	Film 3300pF ±5%
C922				1	1	DF15332300	Film 3300pF ±5%
C923				1	1	DF15331550	Film 330pF ±5%
C924				1	1	DF15331550	Film 330pF ±5%
C925				1	1	DF15332300	Film 3300pF ±5%
C926				1	1	DF15332300	Film 3300pF ±5%
C927				1	1	EA33405030	Elect 0.33μF 50V
C928				1	1	EA33405030	Elect 0.33μF 50V
C929				1	1	DF15333350	Film 0.033μF ±5%
C930				1	1	DF15333350	Film 0.033μF ±5%
C931				1	1	EA10602530	Elect 10μF 25V
C932				1	1	EA10602530	Elect 10μF 25V
C933				1	1	EA10505030	Elect 1μF 50V
C934				1	1	EA10505030	Elect 1μF 50V
C935				1	1	EA47601030	Elect 47μF 10V
C936				1	1	EA47601030	Elect 47μF 10V
C937				1	1	EA10602530	Elect 10μF 25V
C938				1	1	EA10602530	Elect 10μF 25V
C939				1	1	EQ10505030	Elect 1μF 50V
C940				1	1	EQ10505030	Elect 1μF 50V
C941				1	1	EA47601030	Elect 47μF 10V
C942				1	1	DK18103300	Ceramic 0.01μF
C943				1	1	DF15222300	Film 2200pF ±5%
C944				1	1	DF15222300	Film 2200pF ±5%
C951				1	1	DF15104350	Film 0.1μF ±5%
C952				1	1	DF15104350	Film 0.1μF ±5%
C953				1	1	DF15104350	Film 0.1μF ±5%
C954				1	1	DF15104350	Film 0.1μF ±5%
C955				1	1	DF15332300	Film 3300pF ±5%
C956				1	1	DF15332300	Film 3300pF ±5%
C957				1	1	DF15332300	Film 3300pF ±5%
C958				1	1	DF15332300	Film 3300pF ±5%
C959				1	1	DF15331550	Film 330pF ±5%
C960				1	1	DF15331550	Film 330pF ±5%
C961				1	1	EA33405030	Elect 0.33μF 50V
C962				1	1	EA33405030	Elect 0.33μF 50V
C963				1	1	DF15333350	Film 0.033μF ±5%
C964				1	1	DF15333350	Film 0.033μF ±5%
C965				1	1	EA10602530	Elect 10μF 25V
C966				1	1	EA10602530	Elect 10μF 25V
C967				1	1	EA10505030	Elect 1μF 50V
C968				1	1	EA10505030	Elect 1μF 50V
C969				1	1	DF15391550	Film 390pF ±5%
C970				1	1	DF15391550	Film 390pF ±5%
C971				1	1	EV22600360	Elect 22μF 3.15V
C972				1	1	EV22600360	Elect 22μF 3.15V
C973				1	1	DF15472300	Film 4700pF ±5%
C974				1	1	DF15472300	Film 4700pF ±5%
C975				1	1	DF15223350	Film 0.022μF ±5%
C976				1	1	DF15223350	Film 0.022μF ±5%
C977				1	1	EA10602530	Elect 10μF 25V
C978				1	1	EA10505030	Elect 1μF 50V
C979				1	1	EA10505030	Elect 1μF 50V
C980				1	1	EA10505030	Elect 1μF 50V
C981				1	1	EA47601030	Elect 47μF 10V
C982				1	1	EA47601030	Elect 47μF 10V
C983				1	1	EA10602530	Elect 10μF 25V
C984				1	1	EA10602530	Elect 10μF 25V
C985				1	1	EA10505030	Elect 1μF 50V
C986				1	1	EA10505030	Elect 1μF 50V

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY U	N	A	E	P	PART NO.	DESCRIPTION
C987				1	1	EA47601030	Elect 47µF 10V
C988				1	1	DK18103300	Ceramic 0.01µF
C989				1	1	DK18103300	Ceramic 0.01µF
C990				1	1	DK18103300	Ceramic 0.01µF
C991				1	1	DF15472300	Film 4700pF ±5%
C992				1	1	DF15472300	Film 4700pF ±5%
							P901-RESISTORS (All Resistors are ±5% & ¼W)
R901				1	1	GD05105140	1MΩ
R902				1	1	GD05105140	1MΩ
R903				1	1	GD05272140	2.7kΩ
R904				1	1	GD05272140	2.7kΩ
R905				1	1	GD05103140	10kΩ
R906				1	1	GD05103140	10kΩ
R907				1	1	GD05563140	56kΩ
R908				1	1	GD05563140	56kΩ
R909				1	1	GD05124140	120kΩ
R910				1	1	GD05124140	120kΩ
R911				1	1	GD05332140	3.3kΩ
R912				1	1	GD05332140	3.3kΩ
R913				1	1	GD05153140	15kΩ
R914				1	1	GD05153140	15kΩ
R915				1	1	GD05472140	4.7kΩ
R916				1	1	GD05472140	4.7kΩ
R917				1	1	GD05151140	150Ω
R918				1	1	GD05151140	150Ω
R919				1	1	GD05153140	15kΩ
R920				1	1	GD05153140	15kΩ
R921				1	1	GD05472140	4.7kΩ
R922				1	1	GD05472140	4.7kΩ
R923				1	1	GD05154140	150kΩ
R924				1	1	GD05154140	150kΩ
R925				1	1	GD05224140	220kΩ
R926				1	1	GD05224140	220kΩ
R927				1	1	GD05472140	4.7kΩ
R928				1	1	GD05472140	4.7kΩ
R929				1	1	GD05153140	15kΩ
R930				1	1	GD05153140	15kΩ
R931				1	1	GD05153140	15kΩ
R932				1	1	GD05153140	15kΩ
R933				1	1	GD05332140	3.3kΩ
R934				1	1	GD05332140	3.3kΩ
R935				1	1	GD05333140	33kΩ
R936				1	1	GD05333140	33kΩ
R937				1	1	GD05103140	10kΩ
R938				1	1	GD05103140	10kΩ
R939				1	1	GD05102140	1kΩ
R940				1	1	GD05102140	1kΩ
R941				1	1	GD05122140	1.2kΩ
R942				1	1	GD05122140	1.2kΩ
R943				1	1	RA02030800	20kΩ(B), Trimming
R944				1	1	RA02030800	20kΩ(B), Trimming
R945				1	1	GD05122140	1.2kΩ
R946				1	1	GD05122140	1.2kΩ
R947				1	1	GD05223140	22kΩ
R948				1	1	GD05223140	22kΩ
R949				1	1	GM11410010	1kΩ ±1%
R950				1	1	RA02020800	20kΩ(B), Trimming

REF. DESIG.	Q'TY U	N	A	E	P	PART NO.	DESCRIPTION
R951				1	1	GD05105140	1MΩ
R952				1	1	GD05105140	1MΩ
R953				1	1	GD05122140	1.2kΩ
R954				1	1	GD05122140	1.2kΩ
R955				1	1	GD05154140	150kΩ
R956				1	1	GD05154140	150kΩ
R957				1	1	GD05224140	220kΩ
R958				1	1	GD05224140	220kΩ
R959				1	1	GD05472140	4.7kΩ
R960				1	1	GD05472140	4.7kΩ
R961				1	1	GD05153140	15kΩ
R962				1	1	GD05153140	15kΩ
R963				1	1	GD05153140	15kΩ
R964				1	1	GD05153140	15kΩ
R965				1	1	GD05332140	3.3kΩ
R966				1	1	GD05332140	3.3kΩ
R967				1	1	GD05333140	33kΩ
R968				1	1	GD05333140	33kΩ
R969				1	1	GD05153140	15kΩ
R970				1	1	GD05153140	15kΩ
R971				1	1	GD05472140	4.7kΩ
R972				1	1	GD05472140	4.7kΩ
R973				1	1	GD05151140	150Ω
R974				1	1	GD05151140	150Ω
R975				1	1	GD05153140	15kΩ
R976				1	1	GD05153140	15kΩ
R977				1	1	GD05472140	4.7kΩ
R978				1	1	GD05472140	4.7kΩ
R979				1	1	GD05103140	10kΩ
R980				1	1	GD05103140	10kΩ
R981				1	1	GD05102140	1kΩ
R982				1	1	GD05102140	1kΩ
R983				1	1	GD05122140	1.2kΩ
R984				1	1	GD05122140	1.2kΩ
R985				1	1	GD05223140	22kΩ
R986				1	1	GD05223140	22kΩ
R987				1	1	GD05122140	1.2kΩ
R988				1	1	GD05122140	1.2kΩ
R989				1	1	GD05223140	22kΩ
R990				1	1	GD05223140	22kΩ
R991				1	1	GM11410010	1kΩ ±1%
R992				1	1	RA02020800	20kΩ(B), Trimming
R993				1	1	GD05124140	120kΩ
R994				1	1	GD05124140	120kΩ
R995				1	1	GD05124140	120kΩ
R996				1	1	GD05124140	120kΩ
							P901-SEMICONDUCTORS
Q901				1	1	HT326342A0	Transistor 2SC2634(R or S)
Q902				1	1	HT326342A0	Transistor 2SC2634(R or S)
Q903				1	1	HT326342A0	Transistor 2SC2634(R or S)
Q904				1	1	HT326342A0	Transistor 2SC2634(R or S)
Q905				1	1	HC10039020	IC AN6291
Q906				1	1	HC10003090	IC NJM4558D
Q907				1	1	HC10003090	IC NJM4558D
Q951				1	1	HT326342A0	Transistor 2SC2634(R or S)
Q952				1	1	HT326342A0	Transistor 2SC2634(R or S)
Q953				1	1	HC10039020	IC AN6291
Q954				1	1	HC10040020	IC AN6558
Q955				1	1	HC10003090	IC NJM4558D

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
							PE01-RECORD VOLUME CIRCUIT BOARD
PE01	1	1	1	1	1	YK132T1720	P.W. Board, Record Volume
	1	1	1	1	1	ZZ132T1720	P.W. Board Assembly
RE91	1	1	1	1	1	RX05030210	Variable Resistor, 50kΩ(L)
RE92	1	1	1	1	1	RX05030210	Variable Resistor, 50kΩ(R)
							PJ01-MAIN CIRCUIT BOARD
PJ01	1	1	1	1	1	YK132T1710	P.W. Board, Main
	1	1	1	1	1	ZZ132T1710	P.W. Board Assembly
							PJ01-CAPACITORS
CE01	1	1	1	1	1	DD15470370	Ceramic 47pF ±5%
CE02	1	1	1	1	1	DD15470370	Ceramic 47pF ±5%
CE03	1	1	1	1	1	EQ22505030	Elect 2.2μF 50V
CE04	1	1	1	1	1	EQ22505030	Elect 2.2μF 50V
CE05	1	1	1	1	1	EA47601630	Elect 47μF 16V
CE06	1	1	1	1	1	EA47601630	Elect 47μF 16V
CE09	1	1	1	1	1	EA10601630	Elect 10μF 16V
CE10	1	1	1	1	1	EA10601630	Elect 10μF 16V
⚠CE11	1	1	1	1	1	EA10701630	Elect 100μF 16V
⚠CE12	1	1	1	1	1	EA10701630	Elect 100μF 16V
CE91	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CE92	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CJ01	1	1	1	1	1	DF55391090	Film 390pF ±5%
CJ02	1	1	1	1	1	DF55391090	Film 390pF ±5%
CJ03	1	1	1	1	1	EA22701630	Elect 220μF 16V
CJ04	1	1	1	1	1	EA22701630	Elect 220μF 16V
CJ05	1	1	1	1	1	DF15153350	Film 0.015μF ±5%
CJ06	1	1	1	1	1	DF15153350	Film 0.015μF ±5%
CJ07	1	1	1	1	1	DF15821550	Film 820pF ±5%
CJ08	1	1	1	1	1	DF15821550	Film 820pF ±5%
CJ09	1	1	1	1	1	DD15561370	Ceramic 560pF ±5%
CJ10	1	1	1	1	1	DD15561370	Ceramic 560pF ±5%
CJ11	1	1	1	1	1	EQ10601630	Elect 10μF 16V
CJ12	1	1	1	1	1	EQ10601630	Elect 10μF 16V
CJ13	1	1	1	1	1	DF15822300	Film 8200pF ±5%
CJ14	1	1	1	1	1	DF15822300	Film 8200pF ±5%
CJ15	1	1	1	1	1	DF15821550	Film 820pF ±5%
CJ16	1	1	1	1	1	DF15821550	Film 820pF ±5%
CJ17	1	1	1	1	1	DD15331370	Ceramic 330pF ±5%
CJ18	1	1	1	1	1	DD15331370	Ceramic 330pF ±5%
CJ19	1	1	1	1	1	DF15821550	Film 820pF ±5%
CJ20	1	1	1	1	1	DF15821550	Film 820pF ±5%
CJ21	1	1	1	1	1	EA10505030	Elect 1μF 50V
CJ22	1	1	1	1	1	EA10505030	Elect 1μF 50V
CJ23	1	1	1	1	1	EA47601630	Elect 47μF 16V
CJ24	1	1	1	1	1	EA47601630	Elect 47μF 16V
CJ25	1	1	1	1	1	EA10701630	Elect 100μF 16V
CJ26	1	1	1	1	1	EA10701630	Elect 100μF 16V
CJ27	1	1	1	1	1	EA10505030	Elect 1μF 50V
CJ28	1	1	1	1	1	EA10505030	Elect 1μF 50V
CJ29	1	1	1	1	1	EA47601630	Elect 47μF 16V
CJ30	1	1	1	1	1	EA47601630	Elect 47μF 16V
CJ31	1	1	1	1	1	EA47601630	Elect 47μF 16V
CJ32	1	1	1	1	1	EA47601630	Elect 47μF 16V
CJ33	1	1	1	1	1	DD15680370	Cermaic 68pF ±5%
CJ34	1	1	1	1	1	DD15680370	Ceramic 68pF ±5%
CJ35	1	1	1	1	1	DD15680370	Ceramic 68pF ±5%

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
CJ36	1	1	1	1	1	DD15680370	Ceramic 68pF ±5%
⚠CJ41	1	1	1	1	1	EA10701630	Elect 100μF 16V
CJ42	1	1	1	1	1	EA10701630	Elect 100μF 16V
CJ71	1	1	1	1	1	DF15103350	Film 0.01μF ±5%
CJ72	1	1	1	1	1	DF15473350	Film 0.047μF ±5%
CJ73	1	1	1	1	1	DF15102300	Film 0.001μF ±5%
CJ74	1	1	1	1	1	DF15101370	Film 100pF ±5%
CJ75	1	1	1	1	1	DF15103350	Film 0.01μF ±5%
CJ76	1	1	1	1	1	DF15333350	Film 0.033μF ±5%
CJ81	1	1	1	1	1	DF15103350	Film 0.01μF ±5%
CJ82	1	1	1	1	1	DF15103350	Film 0.01μF ±5%
CJ85	1	1	1	1	1	EA10601630	Elect 10μF 16V
CJ86	1	1	1	1	1	EA10601630	Elect 10μF 16V
CJ89	1	1	1	1	1	EA10601630	Elect 10μF 16V
CJ90	1	1	1	1	1	EA10601630	Elect 10μF 16V
CJ91	1	1	1	1	1	EA47601630	Elect 47μF 16V
CJ93	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CU01	1	1	1	1	1	DD15221370	Ceramic 220pF ±5%
CU02	1	1	1	1	1	DD15221370	Ceramic 220pF ±5%
CU03	1	1	1	1	1	EA10701030	Elect 100μF 10V
CU04	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CU05	1	1	1	1	1	EA33601630	Elect 33μF 16V
⚠CU07	1	1	1	1	1	EA10701630	Elect 100μF 16V
⚠CU08	1	1	1	1	1	EA22702530	Elect 220μF 25V
CU09	1	1	1	1	1	DF15104350	Film 0.1μF ±5%
CU10	1	1	1	1	1	EQ47502530	Elect 4.7μF 25V
CU11	1	1	1	1	1	EA47601030	Elect 47μF 10V
CU21	1	1	1	1	1	EA10601630	Elect 10μF 16V
CU22	1	1	1	1	1	DK18223320	Ceramic 0.022μF
CU23	1	1	1	1	1	DK18223320	Ceramic 0.022μF
CU24	1	1	1	1	1	EA22601630	Elect 22μF 16V
CU26	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CU27	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CU28	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CU29	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CX01	1	1	1	1	1	EA10505030	Elect 1μF 50V
CX02	1	1	1	1	1	EA10505030	Elext 1μF 50V
CX03	1	1	1	1	1	EA10601630	Elect 10μF 16V
CX04	1	1	1	1	1	EA10601630	Elect 10μF 16V
							PJ01-RESISTORS (All Resistors are ±5% & ¼W)
RE01	1	1	1	1	1	GD05333140	33kΩ
RE02	1	1	1	1	1	GD05333140	33kΩ
RE05	1	1	1	1	1	GD05103140	10kΩ
RE06	1	1	1	1	1	GD05103140	10kΩ
RE07	1	1	1	1	1	GD05821140	820Ω
RE08	1	1	1	1	1	GD05821140	820Ω
RE09	1	1	1	1	1	GD05683140	68kΩ
RE10	1	1	1	1	1	GD05683140	68kΩ
RE11	1	1	1	1	1	GD05222140	2.2kΩ
RE12	1	1	1	1	1	GD05222140	2.2kΩ
⚠RE13	1	1	1	1	1	GA05181010	180Ω 1W
⚠RE14	1	1	1	1	1	GA05181010	180Ω 1W
RE21	1	1	1	1	1	GD05153140	15kΩ
RE22	1	1	1	1	1	GD05153140	15kΩ
RE23	1	1	1	1	1	GD05473140	47kΩ
RE24	1	1	1	1	1	GD05473140	47kΩ
RE25	1	1	1	1	1	GD05153140	15kΩ
RE26	1	1	1	1	1	GD05562140	5.6kΩ
RE27	1	1	1	1	1	GD05392140	3.9kΩ

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
RJ01	1	1	1	1	1	GD05473140	47kΩ
RJ02	1	1	1	1	1	GD05473140	47kΩ
RJ03	1	1	1	1	1	GD05560140	56Ω
RJ04	1	1	1	1	1	GD05560140	56Ω
RJ05	1	1	1	1	1	GD05334140	330kΩ
RJ06	1	1	1	1	1	GD05334140	330kΩ
RJ07	1	1	1	1	1	GD05183140	18kΩ
RJ08	1	1	1	1	1	GD05183140	18kΩ
RJ09	1	1	1	1	1	GD05183140	18kΩ
RJ10	1	1	1	1	1	GD05183140	18kΩ
RJ11	1	1	1	1	1	GD05183140	18kΩ
RJ12	1	1	1	1	1	GD05183140	18kΩ
RJ13	1	1	1	1	1	GD05562140	5.6kΩ
RJ14	1	1	1	1	1	GD05562140	5.6kΩ
RJ15	1	1	1	1	1	GD05104140	100kΩ
RJ16	1	1	1	1	1	GD05104140	100kΩ
RJ17	1	1	1	1	1	GD05682140	6.8kΩ
RJ18	1	1	1	1	1	GD05682140	6.8kΩ
RJ19	1	1	1	1	1	GD05334140	330kΩ
RJ20	1	1	1	1	1	GD05334140	330kΩ
RJ21	1	1	1	1	1	GD05153140	15kΩ
RJ22	1	1	1	1	1	GD05153140	15kΩ
RJ23	1	1	1	1	1	RA05030800	50kΩ, Trimming
RJ24	1	1	1	1	1	RA05030800	50kΩ, Trimming
RJ25	1	1	1	1	1	RA05030800	50kΩ, Trimming
RJ26	1	1	1	1	1	RA05030800	50kΩ, Trimming
RJ29	1	1	1	1	1	GD05103140	10kΩ
RJ30	1	1	1	1	1	GD05103140	10kΩ
RJ31	1	1	1	1	1	GD05103140	10kΩ
RJ32	1	1	1	1	1	GD05103140	10kΩ
RJ33	1	1	1	1	1	GD05153140	15kΩ
RJ34	1	1	1	1	1	GD05153140	15kΩ
RJ35	1	1	1	1	1	RM01030220	10kΩ, Variable
RJ37	1	1	1	1	1	GD05102140	1kΩ
RJ38	1	1	1	1	1	GD05102140	1kΩ
RJ39	1	1	1	1	1	GD05473140	47kΩ
RJ40	1	1	1	1	1	GD05473140	47kΩ
RJ41	1	1	1	1	1	GD05103140	10kΩ
RJ42	1	1	1	1	1	GD05103140	10kΩ
RJ43	1	1	1	1	1	GD05393140	39kΩ
RJ44	1	1	1	1	1	GD05393140	39kΩ
RJ45	1	1	1	1	1	GD05680140	68Ω
RJ46	1	1	1	1	1	GD05680140	68Ω
RJ47	1	1	1	1	1	GD05561140	560Ω
RJ48	1	1	1	1	1	GD05561140	560Ω
RJ49	1	1	1	1	1	GD05102140	1kΩ
RJ50	1	1	1	1	1	GD05102140	1kΩ
RJ51	1	1	1	1	1	GD05473140	47kΩ
RJ52	1	1	1	1	1	GD05473140	47kΩ
RJ53	1	1	1	1	1	GD05103140	10kΩ
RJ54	1	1	1	1	1	GD05103140	10kΩ
RJ55	1	1	1	1	1	GD05473140	47kΩ
RJ56	1	1	1	1	1	GD05473140	47kΩ
RJ57	1	1	1	1	1	GD05102140	1kΩ
RJ58	1	1	1	1	1	GD05102140	1kΩ
RJ59	1	1	1	1	1	GD05103140	10kΩ
RJ60	1	1	1	1	1	GD05103140	10kΩ
RJ61	1	1	1	1	1	GD05102140	1kΩ
RJ62	1	1	1	1	1	GD05102140	1kΩ
RJ63	1	1	1	1	1	GD05153140	15kΩ

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
RJ64	1	1	1	1	1	GD05153140	15kΩ
RJ65	1	1	1	1	1	GD05102140	1kΩ
RJ66	1	1	1	1	1	GD05102140	1kΩ
RJ70	1	1	1	1	1	GD05154140	150kΩ
RJ71	1	1	1	1	1	GD05273140	27kΩ
RJ72	1	1	1	1	1	GD05562140	5.6kΩ
RJ73	1	1	1	1	1	GD05225140	2.2MΩ
RJ74	1	1	1	1	1	GD05562140	5.6kΩ
RJ75	1	1	1	1	1	GD05471140	470Ω
RJ76	1	1	1	1	1	GD05823140	82kΩ
RJ77	1	1	1	1	1	GD05684140	680kΩ
RJ78	1	1	1	1	1	GD05561140	560Ω
RJ79	1	1	1	1	1	GD05472140	4.7kΩ
RJ80	1	1	1	1	1	GD05333140	33kΩ
RJ81	1	1	1	1	1	GD05102140	1kΩ
RJ82	1	1	1	1	1	GD05104140	100kΩ
RJ83	1	1	1	1	1	GD05104140	100kΩ
RJ84	1	1	1	1	1	GD05104140	100kΩ
RJ85	1	1	1	1	1	GD05103140	10kΩ
RJ86	1	1	1	1	1	GD05103140	10kΩ
RJ87	1	1	1	1	1	GD05181140	180Ω
RJ88	1	1	1	1	1	GD05181140	180Ω
RJ89	1	1	1	1	1	GD05223140	22kΩ
RJ90	1	1	1	1	1	GD05223140	22kΩ
RJ91	1	1	1	1	1	GD05562140	5.6kΩ
RJ92	1	1	1	1	1	GD05562140	5.6kΩ
RJ93	1	1	1	1	1	GG05471120	470Ω ½W
⚠RJ97	1	1	1	1	1	GA05471010	470Ω 1W
⚠RJ98	1	1	1	1	1	GA05471010	470Ω 1W
RU01	1	1	1	1	1	GD05105140	1MΩ
RU02	1	1	1	1	1	GD05102140	1kΩ
RU03	1	1	1	1	1	GD05102140	1kΩ
RU04	1	1	1	1	1	GD05392140	3.9kΩ
RU05	1	1	1	1	1	GD05392140	3.9kΩ
RU06	1	1	1	1	1	GD05153140	15kΩ
RU07	1	1	1	1	1	GD05473140	47kΩ
RU08	1	1	1	1	1	GD05222140	2.2kΩ
⚠RU09	1	1	1	1	1	RF05056120	5.6Ω ½W, Fusible
RU10	1	1	1	1	1	GD05103140	10kΩ
RU11	1	1	1	1	1	GD05103140	10kΩ
RU12	1	1	1	1	1	GD05181140	180Ω
RU13	1	1	1	1	1	GD05181140	180Ω
RU14	1	1	1	1	1	GD05181140	180Ω
RU15	1	1	1	1	1	GD05181140	180Ω
RU16	1	1	1	1	1	GD05181140	180Ω
RU17	1	1	1	1	1	GD05181140	180Ω
RU18	1	1	1	1	1	GD05472140	4.7kΩ
RU19	1	1	1	1	1	GD05561140	560Ω
RU20	1	1	1	1	1	GD05471140	470Ω
RU21	1	1	1	1	1	GD05222140	2.2kΩ
RU22	1	1	1	1	1	GD05103140	10kΩ
RU23	1	1	1	1	1	GD05103140	10kΩ
RU24	1	1	1	1	1	GD05102140	1kΩ
RU25	1	1	1	1	1	GD05102140	1kΩ
RU26	1	1	1	1	1	GD05103140	10kΩ
RU27	1	1	1	1	1	GD05103140	10kΩ
RU28	1	1	1	1	1	GD05103140	10kΩ
RU29	1	1	1	1	1	GD05472140	4.7kΩ
RU30	1	1	1	1	1	GD05103140	10kΩ

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY U	N	A	E	P	PART NO.	DESCRIPTION
RU31	1	1	1	1	1	GD05103140	10kΩ
RU32	1	1	1	1	1	GD05103140	10kΩ
RU33	1	1	1	1	1	GD05103140	10kΩ
RU34	1	1	1	1	1	GD05103140	10kΩ
RU35	1	1	1	1	1	GD05103140	10kΩ
RU36	1	1	1	1	1	GD05103140	10kΩ
RU37	1	1	1	1	1	GD05103140	10kΩ
RU38	1	1	1	1	1	GD05103140	10kΩ
RU39	1	1	1	1	1	GD05103140	10kΩ
RU40	1	1	1	1	1	GD05153140	15kΩ
RU41	1	1	1	1	1	GD05152140	1.5kΩ
RU42	1	1	1	1	1	GD05223140	22kΩ
RU43	1	1	1	1	1	GD05223140	22kΩ
RU44	1	1	1	1	1	GD05102140	1kΩ
RU45	1	1	1	1	1	GD05102140	1kΩ
RU46	1	1	1	1	1	GD05122140	1.2kΩ
RU47	1	1	1	1	1	GD05392140	3.9kΩ
RU48	1	1	1	1	1	GD05392140	3.9kΩ
RU49	1	1	1	1	1	GA05100020	10Ω 2W
RU50	1	1	1	1	1	GD05222140	2.2kΩ
RU51	1	1	1	1	1	GD05562140	5.6kΩ
RU71	1	1	1	1	1	GD05102140	1kΩ
RU72	1	1	1	1	1	GD05102140	1kΩ
RU73	1	1	1	1	1	GD05102140	1kΩ
RU74	1	1	1	1	1	GD05102140	1kΩ
RU75	1	1	1	1	1	GD05102140	1kΩ
⚠RU81	1	1	1	1	1	GG05331120	330Ω ½W
⚠RU82	1	1	1	1	1	GG05181120	180Ω ½W
RU83	1	1	1	1	1	GD05102140	1kΩ
RU84	1	1	1	1	1	GD05562140	5.6kΩ
⚠RU85	1	1	1	1	1	NF02100140	10Ω ½W
RU86	1	1	1	1	1	GD05123140	12kΩ
RU87	1	1	1	1	1	GD05153140	15kΩ
RX01	1	1	1	1	1	RA05030800	50kΩ, Trimming
RX02	1	1	1	1	1	RA05030800	50kΩ, Trimming
RX03	1	1	1	1	1	GD05473140	47kΩ
RX04	1	1	1	1	1	GD05473140	47kΩ
RX05	1	1	1	1	1	GD05223140	22kΩ
RX06	1	1	1	1	1	GD05223140	22kΩ
RX07	1	1	1	1	1	GD05681140	680Ω
RX08	1	1	1	1	1	GD05562140	5.6kΩ
⚠R807	1	1	1	1	1	GA05681010	680Ω 1W
⚠R808	1	1	1	1	1	GA05221010	220Ω 1W
⚠R809	1	1	1	1	1	GA05221010	220Ω 1W
R810	1	1	1	1	1	GD05332140	3.3kΩ
⚠R811	1	1	1	1	1	GA05221010	220Ω 1W
R812	1	1	1	1	1	GD05332140	3.3kΩ
R813	1	1	1	1	1	RA05010800	500Ω, Trimming
R995				1	1	GD05273140	27kΩ
R996				1	1	GD05273140	27kΩ
R997				1	1	GD05395140	3.9MΩ
R998				1	1	GD05395140	3.9MΩ
R999				1	1	GD05102140	1kΩ

REF. DESIG.	Q'TY U	N	A	E	P	PART NO.	DESCRIPTION
							PJ01-SEMICONDUCTORS
DE21	1	1	1	1	1	HD20001000	Diode 1S1555
DE22	1	1	1	1	1	HD20001000	Diode 1S1555
DU01	1	1	1	1	1	HD20001000	Diode 1S1555
DU02	1	1	1	1	1	HD20001000	Diode 1S1555
DU03	1	1	1	1	1	HD20001000	Diode 1S1555
DU04	1	1	1	1	1	HD20001000	Diode 1S1555
DU05	1	1	1	1	1	HD20001000	Diode 1S1555
DU06	1	1	1	1	1	HD30024090	Zener WZ-120
DU07	1	1	1	1	1	HD20015030	Diode DS135D
DU08	1	1	1	1	1	HD20001000	Diode 1S1555
DU10	1	1	1	1	1	HD20001000	Diode 1S1555
DU11	1	1	1	1	1	HD20001000	Diode 1S1555
DU12	1	1	1	1	1	HD20015030	Diode DS135D
DU13	1	1	1	1	1	HD20015030	Diode DS135D
DU14	1	1	1	1	1	HD20015030	Diode DS145D
DU15	1	1	1	1	1	HD20001000	Diode 1S1555
DU16	1	1	1	1	1	HD20001000	Diode 1S1555
DU21	1	1	1	1	1	HD20001000	Diode 1S1555
DU22	1	1	1	1	1	HD20001000	Diode 1S1555
DX01	1	1	1	1	1	HD20001000	Diode 1S1555
DX02	1	1	1	1	1	HD20001000	Diode 1S1555
DX03	1	1	1	1	1	HD20001000	Diode 1S1555
DX04	1	1	1	1	1	HD20001000	Diode 1S1555
⚠D806	1	1	1	1	1	HD30025090	Zener WZ-150
⚠D807	1	1	1	1	1	HD30035090	Zener WZ-061
⚠D808	1	1	1	1	1	HD30035090	Zener WZ-061
⚠D809	1	1	1	1	1	HD30095090	Zener WZ-034
⚠D810	1	1	1	1	1	HD30072090	Zener WZ-100
⚠D811	1	1	1	1	1	HD20001000	Diode 1S1555
⚠D812	1	1	1	1	1	HD20001000	Diode 1S1555
⚠D813	1	1	1	1	1	HD20001000	Diode 1S1555
D999				1	1	HD20001000	Diode 1S1555
QE01	1	1	1	1	1	HC10040020	IC AN6558
QE21	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QE22	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QE23	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QE24	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QE25	1	1	1	1	1	HT107332A0	Transistor 2SA733(P or Q)
QJ01	1	1	1	1	1	HC10017090	IC NJM2043D-D
QJ02	1	1	1	1	1	HC10082050	IC TA7325P
QJ03	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QJ04	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QJ07	1	1	1	1	1	HC10007090	IC NJM4560D
QJ08	1	1	1	1	1	HC10003090	IC NJM4558D
QJ09	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QJ10	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QJ11	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QJ12	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QJ71	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QJ72	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QJ73	1	1	1	1	1	HT326342A0	Transisotr 2SC2634(R or S)
QJ74	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QJ75	1	1	1	1	1	HT107332A0	Transistor 2SA733(P or Q)
QU01	1	1	1	1	1	HC10075030	IC LM6402A-750
QU02	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QU03	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QU04	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QU05	1	1	1	1	1	HT107332A0	Transistor 2SA733(P or Q)

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY U	N	A	E	P	PART NO.	DESCRIPTION
QU06	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QU07	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QU08	1	1	1	1	1	HT313832C0	Transistor 2SC1383(R or S)
QU09	1	1	1	1	1	HT313832C0	Transistor 2SC1383(R or S)
QU10	1	1	1	1	1	HT40894000	Transistor 2SD894
QU11	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QU12	1	1	1	1	1	HT106832C0	Transistor 2SA683(R or S)
QU13	1	1	1	1	1	HT106832C0	Transistor 2SA683(R or S)
QU14	1	1	1	1	1	HT313832C0	Transistor 2SC1383(R or S)
QU15	1	1	1	1	1	HT313832C0	Transistor 2SC1383(R or S)
QU16	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QU17	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QU18	1	1	1	1	1	HT107332A0	Transistor 2SA733(R or Q)
QU19	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
⚠QU21	1	1	1	1	1	HT403131E0	Transistor 2SD313(E)
QU22	1	1	1	1	1	HT308282A0	Transistor 2SC828(E or S)
QU23	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QU24	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QU25	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QX01	1	1	1	1	1	HC10003090	IC NJM4558D
⚠Q804	1	1	1	1	1	HT403131E0	Transistor 2SD313(E)
⚠Q805	1	1	1	1	1	HT403131E0	Transistor 2SD313(E)
⚠Q806	1	1	1	1	1	HT403131E0	Transistor 2SD313(E)
Q807	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
⚠Q808	1	1	1	1	1	HT403131E0	Transistor 2SD313(E)
Q809	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
							PJ01-MISCELLANEOUS
JE01	1	1	1	1	1	YJ01001780	Jack, (3P) Mic L
JE02	1	1	1	1	1	YJ01001780	Jack, (3P) Mic R
JJ01	1	1	1	1	1	YP06002400	Plug, (4P)
JJ02	1	1	1	1	1	YT02040470	Terminal, (4P) RCA Jack
JJ05	1	1	1	1	1	YJ90000220	Jack, (9P) Remote
JJ06	1	1	1	1	1	YP06001070	Plug, (9P)
JJ07	1	1	1	1	1	YP06002430	Plug, (8P)
JJ08	1	1	1	1	1	YJ06002390	Jack, (5P)
JJ09	1	1	1	1	1	YJ06002270	Jack, (8P)
JJ10	1	1	1	1	1	YJ06002270	Jack, (8P)
JJ11	1	1	1	1	1	YJ06002390	Jack, (6P)
JJ13	1	1	1	1	1	YJ06002430	Jack, (3P)
SE01	1	1	1	1	1	SP04010380	Push Switch
SU01				1	1	SP02060040	Push Switch
SU01	1	1	1		1	SP02050080	Push Switch
WJ01	1	1	1	1	1	YU03180260	Jumper Lead, (3P)
WJ02	1	1	1	1	1	YU03160260	Jumper Lead, (3P)
WJ03	1	1	1	1	1	YU06180260	Jumper Lead, (6P)
WJ04	1	1	1	1	1	YU07260260	Jumper Lead, (7P)
WJ05	1	1	1	1	1	YU03520260	Jumper Lead, (3P)
WJ06	1	1	1	1	1	YU06520260	Jumper Lead, (6P)
WJ07	1	1	1	1	1	YU07520260	Jumper Lead, (7P)
WJ08	1	1	1	1	1	YU03500260	Jumper Lead, (3P)
WJ09	1	1	1	1	1	YU07100260	Jumper Lead, (7P)
WJ10	1	1	1	1	1	YU06120260	Jumper Lead, (6P)
WJ11	1	1	1	1	1	YU03280260	Jumper Lead, (3P)
WJ12	1	1	1	1	1	YU03300260	Jumper Lead, (3P)
WJ13	1	1	1	1	1	YU05100260	Jumper Lead, (5P)
XU01	1	1	1	1	1	FQ04003010	Seramic Vib. 400kHz

REF. DESIG.	Q'TY U	N	A	E	P	PART NO.	DESCRIPTION
							PJ02-HEADPHONE JACK CIRCUIT BOARD
PJ02	1	1	1	1	1	YK132T1750	P.W. Board, Headphone Jack
	1	1	1	1	1	ZZ132T1750	P.W. Board Assembly
CE93	1	1	1	1	1	DK18103320	Ceramic Cap. 0.01μF
JJ04	1	1	1	1	1	YJ01001790	Jack, Headphone
							PQ01-AUTO BIAS MAIN CIRCUIT BOARD
PQ01	1	1	1	1	1	YK132T2310	P.W. Board, Auto Bias Main
	1	1	1	1	1	ZZ132T2310	P.W. Board Assembly
							PQ01-CAPACITORS
CK01	1	1	1	1	1	EA10601630	Elect 10μF 16V
CK02	1	1	1	1	1	EA10601630	Elect 10μF 16V
CK03	1	1	1	1	1	EA10601630	Elect 10μF 16V
CK04	1	1	1	1	1	EA10601630	Elect 10μF 16V
CK05	1	1	1	1	1	EA10505030	Elect 1μF 50V
CK06	1	1	1	1	1	EA10505030	Elect 1μF 50V
CK07	1	1	1	1	1	DD15220370	Ceramic 22pF ±5%
CK08	1	1	1	1	1	DD15220370	Ceramic 22pF ±5%
CK09	1	1	1	1	1	DF15222350	Film 2200pF ±5%
CK10	1	1	1	1	1	DF15222350	Film 2200pF ±5%
CK11	1	1	1	1	1	EA10505030	Elect 1μF 50V
CK12	1	1	1	1	1	EA10505030	Elect 1μF 50V
CK13	1	1	1	1	1	DF15102300	Film 0.001μF ±5%
CK14	1	1	1	1	1	DF15102300	Film 0.001μF ±5%
CK15	1	1	1	1	1	DK18473320	Ceramic 0.047μF
CK16	1	1	1	1	1	DK18473320	Ceramic 0.047μF
CK17	1	1	1	1	1	EA10701630	Elect 100μF 16V
CK18	1	1	1	1	1	EA10701630	Elect 100μF 16V
CK19	1	1	1	1	1	EA10601630	Elect 10μF 16V
CK20	1	1	1	1	1	EA10601630	Elect 10μF 16V
CK21	1	1	1	1	1	DF15103350	Film 0.01μF ±5%
CK22	1	1	1	1	1	DF15103350	Film 0.01μF ±5%
CK23	1	1	1	1	1	EA10701630	Elect 100μF 16V
CK24	1	1	1	1	1	EA10701630	Elect 100μF 16V
CK25	1	1	1	1	1	DF15472300	Film 4700pF ±5%
CK26	1	1	1	1	1	DF15472300	Film 4700pF ±5%
CK27	1	1	1	1	1	DF15272300	Film 4700pF ±5%
CK28	1	1	1	1	1	DF15272300	Film 2700pF ±5%
CK29	1	1	1	1	1	EA47502530	Elect 4.7μF 25V
CK30	1	1	1	1	1	EA47502530	Elect 4.7μF 25V
CK31	1	1	1	1	1	EA47502530	Elect 4.7μF 25V
CK32	1	1	1	1	1	EA47502530	Elect 4.7μF 25V
CK35	1	1	1	1	1	EA22405030	Elect 0.22μF 50V
CK36	1	1	1	1	1	EA22405030	Elect 0.22μF 50V
CK37	1	1	1	1	1	EA10601630	Elect 10μF 16V
CK38	1	1	1	1	1	EA10601630	Elect 10μF 16V
CK39	1	1	1	1	1	EA10601630	Elect 10μF 16V
CK40	1	1	1	1	1	EA10601630	Elect 10μF 16V
CK43	1	1	1	1	1	DD15101370	Ceramic 100pF ±5%
CK44	1	1	1	1	1	DD15101370	Ceramic 100pF ±5%
CK45	1	1	1	1	1	DF15683350	Film 0.068μF ±5%
CK46	1	1	1	1	1	DF15683350	Film 0.068μF ±5%
CK47	1	1	1	1	1	DF15823350	Film 0.082μF ±5%
CK48	1	1	1	1	1	DF15823350	Film 0.082μF ±5%
CK51	1	1	1	1	1	DF15103350	Film 0.01μF ±5%

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
CK52	1	1	1	1	1	DF15103350	Film 0.01μF ±5%
CK57	1	1	1	1	1	DK18473320	Ceramic 0.047μF
CK58	1	1	1	1	1	DK18473320	Ceramic 0.047μF
CK59	1	1	1	1	1	EA47601630	Elect 47μF 16V
⚠CK60	1	1	1	1	1	EA47601630	Elect 47μF 16V
⚠CK61	1	1	1	1	1	EA47601630	Elect 47μF 16V
⚠CK62	1	1	1	1	1	EA47601630	Elect 47μF 16V
⚠CK70	1	1	1	1	1	EA47601630	Elect 47μF 16V
CL01	1	1	1	1	1	DF15682300	Film 6800pF ±5%
CL03	1	1	1	1	1	DF15272300	Film 2700pF ±5%
CL04	1	1	1	1	1	DF15272300	Film 2700pF ±5%
CL05	1	1	1	1	1	DF15682550	Film 6800pF ±5%
CL06	1	1	1	1	1	EA47602530	Elect 47μF 25V
CL07	1	1	1	1	1	DF15562550	Film 5600pF ±5%
CL08	1	1	1	1	1	DF15221550	Film 220pF ±5%
CL09	1	1	1	1	1	DF15221550	Film 220pF ±5%
⚠CL10	1	1	1	1	1	EA47601630	Elect 47μF 16V
CL13	1	1	1	1	1	EQ22505030	Elect 2.2μF 50V
CL14	1	1	1	1	1	EQ22505030	Elect 2.2μF 50V
CL15	1	1	1	1	1	DF15221550	Film 220pF ±5%
CL16	1	1	1	1	1	DF15221550	Film 220pF ±5%
CL17	1	1	1	1	1	DF15221550	Film 220pF ±5%
CL18	1	1	1	1	1	DF15221550	Film 220pF ±5%
CL19	1	1	1	1	1	EA10601630	Elect 10μF 16V
CL20	1	1	1	1	1	EA10601630	Elect 10μF 16V
CL21	1	1	1	1	1	DD15470370	Ceramic 47pF ±5%
CL22	1	1	1	1	1	DD15470370	Ceramic 47pF ±5%
CL23	1	1	1	1	1	EA22601030	Elect 22μF 10V
CL24	1	1	1	1	1	EA22601030	Elect 22μF 10V
CL25	1	1	1	1	1	EA10601630	Elect 10μF 16V
CL26	1	1	1	1	1	EA10601630	Elect 10μF 16V
CL27	1	1	1	1	1	DF15221550	Film 220pF ±5%
CL28	1	1	1	1	1	DF15221550	Film 220pF ±5%
CL31	1	1	1	1	1	DF15104350	Film 0.1μF ±5%
CL32	1	1	1	1	1	DF15104350	Film 0.1μF ±5%
CQ01	1	1	1	1	1	DF15472550	Film 4700pF ±5%
CQ02	1	1	1	1	1	DF15472550	Film 4700pF ±5%
CQ03	1	1	1	1	1	DK18473320	Ceramic 0.047μF
CQ04	1	1	1	1	1	DK18473320	Ceramic 0.047μF
CQ05	1	1	1	1	1	DF15104350	Film 0.1μF ±5%
CQ07	1	1	1	1	1	EA47601630	Elect 47μF 16V
CQ08	1	1	1	1	1	EA47601630	Elect 47μF 16V
CQ09	1	1	1	1	1	DF15473350	Film 0.047μF ±5%
CQ10	1	1	1	1	1	DF15473350	Film 0.047μF ±5%
CQ11	1	1	1	1	1	EA47601030	Elect 47μF 10V
CQ12	1	1	1	1	1	EA47601030	Elect 47μF 10V
CQ13	1	1	1	1	1	EA47601630	Elect 47μF 16V
⚠CQ14	1	1	1	1	1	EA47601630	Elect 47μF 16V
CQ15	1	1	1	1	1	DF15102300	Film 0.001μF ±5%
CQ21	1	1	1	1	1	DK16103300	Ceramic 0.01μF ±10%
CQ22	1	1	1	1	1	DK18473320	Ceramic 0.047μF
CQ23	1	1	1	1	1	EA10800630	Elect 1000μF 6.3V
CQ24	1	1	1	1	1	EA47502530	Elect 4.7μF 25V
CQ25	1	1	1	1	1	DK16103300	Ceramic 0.01μF ±10%
CQ26	1	1	1	1	1	EA22601030	Elect 22μF 10V
CQ27	1	1	1	1	1	DK16103300	Ceramic 0.01μF ±10%
CQ28	1	1	1	1	1	EA22601030	Elect 22μF 10V
CQ29	1	1	1	1	1	DF15334350	Film 0.33μF ±5%
CQ30	1	1	1	1	1	EA10701030	Elect 100μF 10V
CQ31	1	1	1	1	1	EA47601030	Elect 47μF 10V

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
							PQ01-RESISTORS **(All Resistors are ±5% & ¼W)**
RK01	1	1	1	1	1	GD05103140	10kΩ
RK02	1	1	1	1	1	GD05103140	10kΩ
RK03	1	1	1	1	1	GD05223140	22kΩ
RK04	1	1	1	1	1	GD05223140	22kΩ
RK05	1	1	1	1	1	GD05223140	22kΩ
RK06	1	1	1	1	1	GD05223140	22kΩ
RK07	1	1	1	1	1	GD05472140	4.7kΩ
RK08	1	1	1	1	1	GD05472140	4.7kΩ
RK09	1	1	1	1	1	GD05124140	120kΩ
RK10	1	1	1	1	1	GD05124140	120kΩ
RK11	1	1	1	1	1	RA05030800	50kΩ, Trimming
RK12	1	1	1	1	1	RA05030800	50kΩ, Trimming
RK13	1	1	1	1	1	GD05333140	33kΩ
RK14	1	1	1	1	1	GD05333140	33kΩ
RK15	1	1	1	1	1	GD05103140	10kΩ
RK16	1	1	1	1	1	GD05103140	10kΩ
RK17	1	1	1	1	1	GD05223140	22kΩ
RK18	1	1	1	1	1	GD05223140	22kΩ
RK19	1	1	1	1	1	GD05562140	5.6kΩ
RK20	1	1	1	1	1	GD05562140	5.6kΩ
RK21	1	1	1	1	1	GD05272140	2.7kΩ
RK22	1	1	1	1	1	GD05272140	2.7kΩ
RK23	1	1	1	1	1	GD05562140	5.6kΩ
RK24	1	1	1	1	1	GD05562140	5.6kΩ
RK25	1	1	1	1	1	GD05103140	10kΩ
RK26	1	1	1	1	1	GD05103140	10kΩ
RK27	1	1	1	1	1	GD05123140	12kΩ
RK28	1	1	1	1	1	GD05123140	12kΩ
RK29	1	1	1	1	1	GD05822140	8.2kΩ
RK30	1	1	1	1	1	GD05822140	8.2kΩ
RK31	1	1	1	1	1	GD05102140	1kΩ
RK32	1	1	1	1	1	GD05102140	1kΩ
RK33	1	1	1	1	1	GD05822140	8.2kΩ
RK34	1	1	1	1	1	GD05822140	8.2kΩ
RK35	1	1	1	1	1	GD05103140	10kΩ
RK36	1	1	1	1	1	GD05103140	10kΩ
RK37	1	1	1	1	1	GD05222140	2.2kΩ
RK38	1	1	1	1	1	GD05222140	2.2kΩ
RK39	1	1	1	1	1	GD05123140	12kΩ
RK40	1	1	1	1	1	GD05123140	12kΩ
RK41	1	1	1	1	1	GD05153140	15kΩ
RK42	1	1	1	1	1	GD05153140	15kΩ
RK43	1	1	1	1	1	GD05473140	47kΩ
RK44	1	1	1	1	1	GD05473140	47kΩ
RK45	1	1	1	1	1	GD05681140	680Ω
RK46	1	1	1	1	1	GD05681140	680Ω
RK47	1	1	1	1	1	GD05392140	3.9kΩ
RK48	1	1	1	1	1	GD05392140	3.9kΩ
RK49	1	1	1	1	1	GD05274140	270kΩ
RK50	1	1	1	1	1	GD05274140	270kΩ
RK51	1	1	1	1	1	GD05102140	1kΩ
RK52	1	1	1	1	1	GD05102140	1kΩ
RK53	1	1	1	1	1	GD05473140	47kΩ
RK54	1	1	1	1	1	GD05473140	47kΩ
RK55	1	1	1	1	1	GD05102140	1kΩ
RK56	1	1	1	1	1	GD05102140	1kΩ
RK57	1	1	1	1	1	GD05822140	8.2kΩ
RK58	1	1	1	1	1	GD05822140	8.2kΩ
RK59	1	1	1	1	1	GD05681140	680Ω
RK60	1	1	1	1	1	GD05681140	680Ω

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
RK63	1	1	1	1	1	GD05271140	270Ω
RK64	1	1	1	1	1	GD05271140	270Ω
RK65	1	1	1	1	1	GD05182140	1.8kΩ
RK66	1	1	1	1	1	GD05182140	1.8kΩ
RK67	1	1	1	1	1	GD05103140	10kΩ
RK68	1	1	1	1	1	GD05103140	10kΩ
RK69	1	1	1	1	1	GD05153140	15kΩ
RK70	1	1	1	1	1	GD05153140	15kΩ
RK71	1	1	1	1	1	GD05153140	15kΩ
RK72	1	1	1	1	1	GD05153140	15kΩ
RK73	1	1	1	1	1	GD05153140	15kΩ
RK74	1	1	1	1	1	GD05153140	15kΩ
RK75	1	1	1	1	1	RA02030800	20kΩ, Trimming
RK76	1	1	1	1	1	RA02030800	20kΩ, Trimming
RK77	1	1	1	1	1	RA01030800	10kΩ, Trimming
RK78	1	1	1	1	1	RA01030800	10kΩ, Trimming
RK79	1	1	1	1	1	GD05821140	820Ω
RK80	1	1	1	1	1	GD05821140	820Ω
⚠RK81	1	1	1	1	1	GA05181010	180Ω 1W
⚠RK82	1	1	1	1	1	GA05181010	180Ω 1W
RK83	1	1	1	1	1	GD05333140	33kΩ
RK84	1	1	1	1	1	GD05333140	33kΩ
RL01	1	1	1	1	1	GD05333140	33kΩ
RL02	1	1	1	1	1	GD05333140	33kΩ
RL03	1	1	1	1	1	GD05100140	10Ω
RL04	1	1	1	1	1	GD05100140	10Ω
RL05	1	1	1	1	1	GD05472140	4.7kΩ
RL06	1	1	1	1	1	GD05472140	4.7kΩ
RL07	1	1	1	1	1	GD05103140	10kΩ
RL08	1	1	1	1	1	GD05103140	10kΩ
RL09	1	1	1	1	1	GD05103140	10kΩ
RL10	1	1	1	1	1	GD05103140	10kΩ
RL11	1	1	1	1	1	GD05102140	1kΩ
RL12	1	1	1	1	1	GD05102140	1kΩ
RL13	1	1	1	1	1	GD05102140	1kΩ
RL14	1	1	1	1	1	GD05102140	1kΩ
RL15	1	1	1	1	1	GD05100140	10Ω
RL16	1	1	1	1	1	GD05100140	10Ω
RL17	1	1	1	1	1	GD05153140	15kΩ
RL18	1	1	1	1	1	GD05153140	15kΩ
RL19	1	1	1	1	1	GD05153140	15kΩ
RL20	1	1	1	1	1	GD05153140	15kΩ
RL21	1	1	1	1	1	GD05182140	1.8kΩ
RL22	1	1	1	1	1	GD05182140	1.8kΩ
RL23	1	1	1	1	1	GD05392140	3.9kΩ
RL24	1	1	1	1	1	GD05392140	3.9kΩ
RL25	1	1	1	1	1	GD05332140	3.3kΩ
RL26	1	1	1	1	1	GD05332140	3.3kΩ
RL27	1	1	1	1	1	GD05103140	10kΩ
RL28	1	1	1	1	1	GD05103140	10kΩ
RL29	1	1	1	1	1	GD05104140	100kΩ
RL30	1	1	1	1	1	GD05104140	100kΩ
RL31	1	1	1	1	1	GD05153140	15kΩ
RL32	1	1	1	1	1	GD05153140	15kΩ
RL33	1	1	1	1	1	GD05103140	10kΩ
RL34	1	1	1	1	1	GD05103140	10kΩ
RL35	1	1	1	1	1	GD05331140	330Ω
RL36	1	1	1	1	1	GD05331140	330Ω
RL37	1	1	1	1	1	GD05103140	10kΩ
RL38	1	1	1	1	1	GD05103140	10kΩ
RL39	1	1	1	1	1	GD05473140	47kΩ
RL40	1	1	1	1	1	GD05473140	47kΩ

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
RL41	1	1	1	1	1	GD05103140	10kΩ
RL42	1	1	1	1	1	GD05103140	10kΩ
RL43	1	1	1	1	1	GD05103140	10kΩ
RL44	1	1	1	1	1	GD05103140	10kΩ
RL45	1	1	1	1	1	GD05103140	10kΩ
RL46	1	1	1	1	1	GD05103140	10kΩ
RL47	1	1	1	1	1	GD05822140	8.2kΩ
RL48	1	1	1	1	1	GD05822140	8.2kΩ
RL49	1	1	1	1	1	GD05102140	1kΩ
RL50	1	1	1	1	1	GD05102140	1kΩ
RL51	1	1	1	1	1	GD05272140	2.7kΩ
RL52	1	1	1	1	1	GD05272140	2.7kΩ
RL53	1	1	1	1	1	GD05332140	3.3kΩ
RL54	1	1	1	1	1	GD05332140	3.3kΩ
RL55	1	1	1	1	1	GD05153140	15kΩ
RL56	1	1	1	1	1	GD05153140	15kΩ
RL57	1	1	1	1	1	GD05153140	15kΩ
RL58	1	1	1	1	1	GD05153140	15kΩ
RL59	1	1	1	1	1	RA05010800	500Ω, Trimming
RL60	1	1	1	1	1	RA05010800	500Ω, Trimming
RL61	1	1	1	1	1	GD05224140	220kΩ
RL62	1	1	1	1	1	GD05224140	220kΩ
RL63	1	1	1	1	1	GD05102140	1kΩ
RL64	1	1	1	1	1	GD05102140	1kΩ
RL65	1	1	1	1	1	GD05104140	100kΩ
RL66	1	1	1	1	1	GD05104140	100kΩ
RL67	1	1	1	1	1	GD05103140	10kΩ
RL68	1	1	1	1	1	GD05153140	15kΩ
RL69	1	1	1	1	1	GD05821140	820Ω
RL70	1	1	1	1	1	GD05821140	820Ω
RL71	1	1	1	1	1	GD05102140	1kΩ
RQ01	1	1	1	1	1	GD05104140	100kΩ
RQ02	1	1	1	1	1	GD05823140	82kΩ
RQ03	1	1	1	1	1	GD05103140	10kΩ
RQ04	1	1	1	1	1	GD05222140	2.2kΩ
RQ05	1	1	1	1	1	GD05103140	10kΩ
RQ06	1	1	1	1	1	GD05224140	220kΩ
RQ07	1	1	1	1	1	GD05472140	4.7kΩ
RQ08	1	1	1	1	1	GD05472140	4.7kΩ
RQ09	1	1	1	1	1	GD05180140	18Ω
RQ10	1	1	1	1	1	GD05151140	150Ω
RQ11	1	1	1	1	1	GD05102140	1kΩ
RQ12	1	1	1	1	1	GD05102140	1kΩ
RQ13	1	1	1	1	1	GD05103140	10kΩ
RQ14	1	1	1	1	1	GD05103140	10kΩ
RQ15	1	1	1	1	1	GD05224140	220kΩ
RQ16	1	1	1	1	1	GD05152140	1.5kΩ
RQ17	1	1	1	1	1	GD05103140	10kΩ
RQ18	1	1	1	1	1	RA01030800	10kΩ, Trimming
RQ19	1	1	1	1	1	GD05101140	100Ω
RQ20	1	1	1	1	1	GD05270140	27Ω
RQ21	1	1	1	1	1	GD05224140	220kΩ
RQ22	1	1	1	1	1	GD05224140	220kΩ
RQ23	1	1	1	1	1	GD05224140	220kΩ
RQ24	1	1	1	1	1	GD05224140	220kΩ
RQ25	1	1	1	1	1	GD05224140	220kΩ
RQ26	1	1	1	1	1	GD05224140	220kΩ
RQ27	1	1	1	1	1	GD05471140	470Ω
RQ28	1	1	1	1	1	GD05471140	470Ω
RQ29	1	1	1	1	1	GD05104140	100kΩ
RQ30	1	1	1	1	1	GD05104140	100kΩ

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
RQ31	1	1	1	1	1	GD05470140	47Ω
RQ32	1	1	1	1	1	GD05470140	47Ω
RQ33	1	1	1	1	1	GD05103140	10kΩ
RQ34	1	1	1	1	1	GD05103140	10kΩ
RQ35	1	1	1	1	1	GD05104140	100kΩ
RQ36	1	1	1	1	1	GD05104140	100kΩ
RQ37	1	1	1	1	1	GD05103140	10kΩ
RQ38	1	1	1	1	1	GD05103140	10kΩ
RQ39	1	1	1	1	1	GD05104140	100kΩ
RQ40	1	1	1	1	1	GD05103140	10kΩ
RQ41	1	1	1	1	1	GD05104140	100kΩ
RQ42	1	1	1	1	1	GD05472140	4.7kΩ
RQ43	1	1	1	1	1	GD05333140	33kΩ
RQ44	1	1	1	1	1	GD05393140	39kΩ
RQ45	1	1	1	1	1	GD05224140	220kΩ
RQ46	1	1	1	1	1	GD05102140	10kΩ
RQ47	1	1	1	1	1	GD05100140	10Ω
RQ48	1	1	1	1	1	GD05222140	2.2kΩ
RQ49	1	1	1	1	1	GD05223140	22kΩ
RQ50	1	1	1	1	1	GD05683140	68kΩ
RQ51	1	1	1	1	1	GD05472140	4.7kΩ
RQ52	1	1	1	1	1	GD05472140	4.7kΩ
RQ53	1	1	1	1	1	GD05102140	1kΩ
RQ54	1	1	1	1	1	GD05102140	1kΩ
RQ55	1	1	1	1	1	GD05102140	1kΩ
RQ56	1	1	1	1	1	GD05102140	1kΩ
RQ57	1	1	1	1	1	GD05682140	6.8kΩ
RQ58	1	1	1	1	1	GD05682140	6.8kΩ
RQ59	1	1	1	1	1	GD05332140	3.3kΩ
RQ60	1	1	1	1	1	GD05332140	3.3kΩ
RQ61	1	1	1	1	1	GD05103140	10kΩ
RQ62	1	1	1	1	1	GD05103140	10kΩ
RQ63	1	1	1	1	1	GD05473140	47kΩ
RQ64	1	1	1	1	1	GD05103140	10kΩ
RQ65	1	1	1	1	1	GD05103140	10kΩ
RQ66	1	1	1	1	1	GD05103140	10kΩ
RQ67	1	1	1	1	1	GD05103140	10kΩ
RQ68	1	1	1	1	1	GD05271140	270Ω
RQ69	1	1	1	1	1	GD05271140	270Ω
RQ70	1	1	1	1	1	GD05271140	270Ω
RQ71	1	1	1	1	1	GD05103140	10kΩ
RQ73	1	1	1	1	1	GD05273140	27kΩ
RQ74	1	1	1	1	1	GD05104140	100kΩ
RQ75	1	1	1	1	1	GD05103140	10kΩ
RQ76	1	1	1	1	1	GD05103140	10kΩ
RQ77	1	1	1	1	1	GD05682140	6.8kΩ
RQ78	1	1	1	1	1	GD05682140	6.8kΩ
RQ79	1	1	1	1	1	GD05153140	15kΩ
RQ80	1	1	1	1	1	GD05153140	15kΩ
RQ81	1	1	1	1	1	GD05393140	39kΩ
RQ82	1	1	1	1	1	GD05103140	10kΩ
RQ83	1	1	1	1	1	GD05152140	1.5kΩ
RQ84	1	1	1	1	1	GD05222140	2.2kΩ
RQ85	1	1	1	1	1	GD05473140	47kΩ
⚠RQ86	1	1	1	1	1	GA05181010	180Ω 1W
RQ87	1	1	1	1	1	GA05181010	180Ω 1W
RQ88	1	1	1	1	1	GG05330120	33Ω ½W
RQ89	1	1	1	1	1	GD05103140	10kΩ
RQ90	1	1	1	1	1	GD05472140	4.7kΩ

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
RQ91	1	1	1	1	1	GD05473140	47kΩ
RQ92	1	1	1	1	1	GD05473140	47kΩ
RQ93	1	1	1	1	1	GD05473140	47kΩ
RQ94	1	1	1	1	1	GD05392140	3.9kΩ
RQ95	1	1	1	1	1	GD05102140	1kΩ
RQ96	1	1	1	1	1	GD05102140	1kΩ
RQ97	1	1	1	1	1	GD05335140	3.3MΩ
RQ98	1	1	1	1	1	GD05335140	3.3MΩ
RQ99	1	1	1	1	1	GD05335140	3.3MΩ
RR03	1	1	1	1	1	GD05103140	10kΩ
RR04	1	1	1	1	1	GD05103140	10kΩ
							PQ01-SEMICONDUCTORS
DK01	1	1	1	1	1	HD20001000	Diode 1S1555
DK02	1	1	1	1	1	HD20001000	Diode 1S1555
DL01 ~ DL06	6	6	6	6	6	HD20001000	Diode 1S1555
DQ01	1	1	1	1	1	HD30035010	Zener HZ2B1
DQ02	1	1	1	1	1	HD30076090	Zener WZ038
DQ03	1	1	1	1	1	HD30076090	Diode WZ038
DQ04 ~ DQ15	12	12	12	12	12	HD20001000	Diode 1S1555
DQ16	1	1	1	1	1	HD20003020	Diode MA150
DQ17	1	1	1	1	1	HD20001000	Diode 1S1555
DQ18	1	1	1	1	1	HD20003020	Diode MA150
DQ19	1	1	1	1	1	HD20003020	Diode MA150
DQ20	1	1	1	1	1	HD10004020	Diode OA91
DQ21	1	1	1	1	1	HD30004020	Zener MA1051M
DQ22	1	1	1	1	1	HD20001000	Diode 1S1555
DQ23	1	1	1	1	1	HD20001000	Diode 1S1555
⚠DQ24	1	1	1	1	1	HD30029090	Zener WZ090
DQ25	1	1	1	1	1	HD30029090	Zener WZ090
QK01	1	1	1	1	1	HC10052010	IC HA12020
QK02	1	1	1	1	1	HC10052010	IC HA12020
QK11	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QK12	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QK13	1	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
QK14	1	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
QK15	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QK16	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QK17	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QK18	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QK19	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QK20	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QL01	1	1	1	1	1	HC10082050	IC TA7325P
QL02	1	1	1	1	1	HC10003090	IC NJM4558D
QL03	1	1	1	1	1	HC10015270	IC LM324N
QL07	1	1	1	1	1	HW40001500	Photo Unit P1501
QL08	1	1	1	1	1	HW40001500	Photo Unit P1501
QL11	1	1	1	1	1	HT313841S0	Transistor 2SC1384(S)
QL12	1	1	1	1	1	HT313841S0	Transistor 2SC1384(S)
QL13	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QL14	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QL15	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QL16	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QL17	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QL18	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QL19	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QL51	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QL52	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QL53	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QL54	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)

(U): for U.S.A.
(N): for Europe
(A): for Australia
(E): for Europe
(P): for PX

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
QQ01	1	1	1	1	1	HC10101030	IC LC6502C
QQ02	1	1	1	1	1	HC736700A0	IC 74LS367A
QQ03	1	1	1	1	1	HC10007090	IC NJM4560D
QQ04	1	1	1	1	1	HC10003090	IC NJM4558D
QQ05	1	1	1	1	1	HC10021370	IC MC3403N
QQ11	1	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
QQ12	1	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
QQ13	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QQ14	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QQ15	1	1	1	1	1	HT326342A0	Transistor 2SC2634(R or S)
QQ16 ~ QQ25	10	10	10	10	10	HT308282A0	Transistor 2SC828(R or S)
QQ26	1	1	1	1	1	HT107332A0	Transistor 2SA733(P or Q)
QQ27	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QQ28	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
QQ29	1	1	1	1	1	HT320621C0	Transistor 2SC2062(S)
QQ30	1	1	1	1	1	HT308282A0	Transistor 2SC828(R or S)
							PQ01-MISCELLANEOUS
JL01	1	1	1	1	1	YP06002400	Plug, (4P)
JL02	1	1	1	1	1	YP06002360	Plug, (3P)
JQ01	1	1	1	1	1	YP06003160	Plug, (10P)
JQ02	1	1	1	1	1	YJ06002440	Jack, (4P)
JQ03	1	1	1	1	1	YJ06002440	Jack, (4P)
LK01	1	1	1	1	1	LC22260600	Choke Coil, 22mH
LK02	1	1	1	1	1	LC22260600	Choke Ciol, 22mH
LK03	1	1	1	1	1	LC22260600	Choke Coil, 22mH
LK04	1	1	1	1	1	LC22260600	Choke Coil, 22mH
LK05	1	1	1	1	1	LC24750600	Choke Coil, 4.7mH
LK06	1	1	1	1	1	LC24750600	Choke Coil, 4.7mH
LL01	1	1	1	1	1	TC10140190	OSC Transformer, 105kHz
SQ01	1	1	1	1	1	SS01020410	Slide Switch
WQ01	1	1	1	1	1	YU05100260	Jumper Lead, (5P)
WQ02	1	1	1	1	1	YU08100260	Jumper Lead, (8P)
WQ03	1	1	1	1	1	YU08100260	Jumper Lead, (8P)
WQ04	1	1	1	1	1	YU04340260	Jumper Lead, (4P)
WQ05	1	1	1	1	1	YU04480260	Jumper Lead, (4P)
WQ06	1	1	1	1	1	YU04500260	Jumper Lead, (4P)
ZQ01	1	1	1	1	1	ZB09010010	Battery
							PQ02-AUTO BIAS KEY SW. CISRCUIT BOARD
PQ02	1	1	1	1	1	YK132T2320	P.W. Board, Auto Bias Key
	1	1	1	1	1	ZZ132T2320	P.W. Board, Assembly SW.
RQ72	1	1	1	1	1	GD05472140	Resistor 4.7kΩ ±5% ¼W
DQ92	1	1	1	1	1	HI10037020	L.E.D. LN322GP
DQ93	1	1	1	1	1	HI10037020	L.E.D. LN322GP
DQ94	1	1	1	1	1	HI10025020	L.E.D. LN222RP
SQ91	1	1	1	1	1	SP01010580	Push Switch, Auto
SQ92	1	1	1	1	1	SP01010580	Push Switch, Start
SQ93	1	1	1	1	1	SP01010580	Push Switch, Reset

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	A	E	P		
							PQ03-AUTO BIAS SUB CIRCUIT BOARD
PQ03	1	1	1	1	1	YK132T2330	P.W. Board, Auto Bias Sub
	1	1	1	1	1	ZZ132T2330	P.W. Board Assembly
RR01	1	1	1	1	1	GD05103140	Resistor 10kΩ ±5% ¼W
RR02	1	1	1	1	1	GD05103140	Resistor 10kΩ ±5% ¼W
RR05	1	1	1	1	1	GD05472140	Resistor 4.7kΩ ±5%, ¼W
RR06	1	1	1	1	1	GD05222140	Resistor 2.2kΩ ±5%, ¼W
QQ31	1	1	1	1	1	HC401100B0	IC CD4011BE
QQ32	1	1	1	1	1	HT308282A0	Transistor 2SC828 (R or S)
JQ04	1	1	1	1	1	YJ06002430	Jack, (3P)
JQ05	1	1	1	1	1	YJ06002530	Jack, (3P)
							PU01-TIMER SWITCH CIRCUIT BOARD
PU01	1	1	1	1	1	YK132T1760	P.W. Board, Timer Switch
	1	1	1	1	1	ZZ132T1760	P.W. Board Assembly
S501	1	1	1	1	1	SS02030190	Slide Switch, 2-3
							PY01-KEY SWITCH CIRCUIT BOARD
PY01	1	1	1	1	1	YK132T1730	P.W. Board, Key Switch
	1	1	1	1	1	ZZ132T1730	P.W. Board Assembly
DY01	1	1	1	1	1	HI10035020	L.E.D. LN38GP, FF
DY02	1	1	1	1	1	HI10035020	L.E.D. LN38GP, PLAY
DY03	1	1	1	1	1	HI10035020	L.E.D. LN38GP, REW
DY04	1	1	1	1	1	HI10036020	L.E.D. LN48YP, PAUSE
DY05	1	1	1	1	1	HI10022020	L.E.D. LN28RP, REC
DY06	1	1	1	1	1	HI10022020	L.E.D. LN28RP, Mute/Skip
DY07	1	1	1	1	1	HD20001000	Diode 1S1555
SY01	1	1	1	1	1	SP01010580	Push Switch, FF
SY02	1	1	1	1	1	SP01010580	Push Switch, PLAY
SY03	1	1	1	1	1	SP01010580	Push Switch, REW
SY04	1	1	1	1	1	SP01010580	Push Switch, PAUSE
SY05	1	1	1	1	1	SP01010580	Push Switch, REC
SY06	1	1	1	1	1	SP01010580	Push Switch, MUTE/SKIP-M
SY07	1	1	1	1	1	SP01010580	Push Switch, STOP
SY08	1	1	1	1	1	SP01010580	Push Switch, STOP
							PY02-INDICATOR CIRCUIT BOARD
PY02	1	1	1	1	1	YK132T1740	P.W. Board, Indicator
	1	1	1	1	1	ZZ132T1740	P.W. Board Assembly
DY11	1	1	1	1	1	HI10031020	L.E.D. LN324GP, Dolby-B
DY12	1	1	1	1	1	HI10031020	L.E.D. LN324GP, Dolby-C
DY13	1	1	1	1	1	HI10031020	L.E.D. LN324GP, Metal
DY14	1	1	1	1	1	HI10031020	L.E.D. LN324GP, CrO$_2$
DY15	1	1	1	1	1	HI10031020	L.E.D. LN324GP, Normal

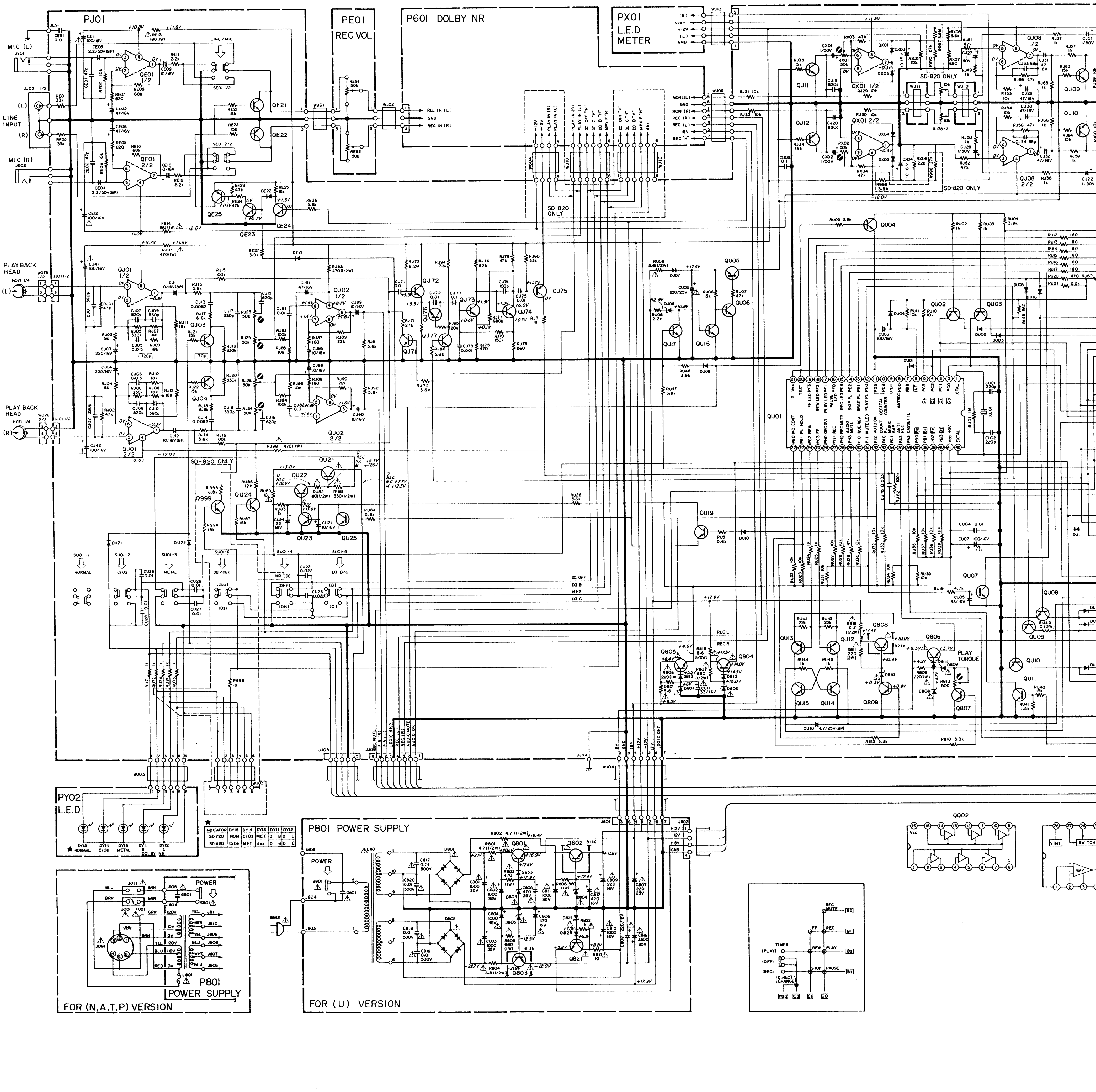
(W01-99)	**Assembly and Wiring**
(T01-99)	**Adjustment**
(X01-00)	**Correction**

NOTE ON SAFETY:
SYMBOL ⚠ FIRE OR ELECTRICAL SHOCK HAZARD. ONLY ORIGINAL PARTS SHOULD BE USED TO REPLACE ANY PART MARKED WITH SYMBOL ⚠. ANY OTHER COMPONENT SUBSTITUTION (OTHER THAN ORIGINAL TYPE), MAY INCREASE RISK OF FIRE OR ELECTRICAL SHOCK HAZARD.

12. TECHNICAL SPECIFICATIONS

Style	Front load
Tape Drive System	Single Capstan Drive
Cartridge	Philips type compact cassette
Track System	Compatible Stereo 4-track 2-channel
Tape Speed	4.75 cm/sec.
Heads	Rec/Play Combi. type 2 Head System
Composition	Rec/Play: Super Hard Metal Alloy Erase: Dual Gap Ferrite
Motor	2 Motor System Mechanism: Micro Computer Logic
Overall Frequency Response at −20 dB	
Normal Tape	20 Hz ~ 17 kHz
CrO$_2$ Tape	20 Hz ~ 19 kHz
Metal Tape	20 Hz ~ 22 kHz
Signal-to-Noise Ratio:	
Dolby B/C (ON)	65/75 dB
Dolby (OFF)	59 dB
dbX (ON)	85 dB (SD820 dbX only)
Wow and Flutter	
DIN WTD	±0.06%
Outputs	
Line Level/Impedance	700 mV/2 kΩ
Headphone Level/Impedance	75 mV/75 Ω
Input (Level at 0 VU)	
Line Sensitivity/Impedance	65 mV/50 kΩ
Mic Sensitivity/Impedance	0.3 mV/10 kΩ
Fast Rewind Time	80 sec. (C-60)
Fast Forward Time	80 sec. (C-60)
Power Requirements	110/120/220/240 V AC, 50/60 Hz
Power Consumption	30 W
Dimensions (D × H × D)	416 × 100 × 300 mm
Weight	5.6 kg

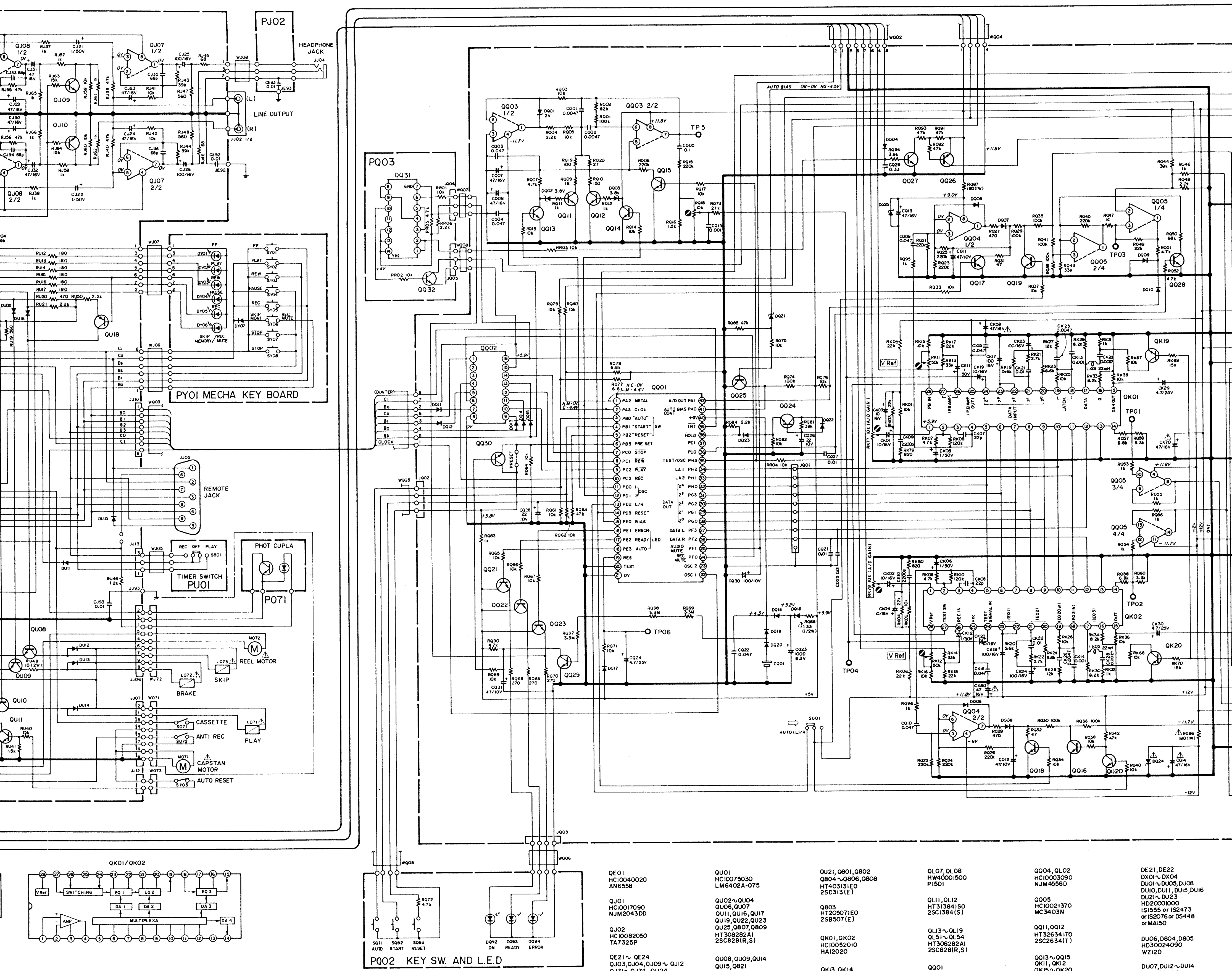
marantz®


PJ01
PE01
REC VOL.
P601 DOLBY NR
PX01
L.E.D
METER
MIC (L)
LINE INPUT
(L)
(R)
MIC (R)
LINE / MIC
QE01 1/2
QE01 2/2
QE21
QE22
QE23
QE24
QE25
REC IN (L)
GND
REC IN (R)
SD-820 ONLY
PLAY BACK HEAD
PLAY BACK HEAD
QJ01 1/2
QJ01 2/2
QJ02 1/2
QJ02 2/2
QJ71
QJ72
QJ73
QJ74
QJ75
QU01
QU02
QU03
QU04
QU05
QU06
QU07
QX01 1/2
QX01 2/2
QJ08 1/2
QJ08 2/2
SD-820 ONLY
NORMAL
CrO2
METAL
DD OFF
DD B
MPX
DD C
REC L
REC R
PLAY TORQUE
PY02
L.E.D
INDICATOR DY15 DY14 DY13 DY12 DY11
SD720 NOM CrO2 MET D B C
SD820 CrO2 MET 4bx D BD C
NORMAL CrO2 METAL DOLBY NR
P801 POWER SUPPLY
POWER
FOR (U) VERSION
P801
POWER SUPPLY
FOR (N,A,T,P) VERSION
QQ02
TIMER
(PLAY)
(OFF)
(REC)
REC MUTE
FF
REC
REW
PLAY
STOP
PAUSE
(DIRECT CHANGE)

NOTE ON SAFETY:

Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

SCHEMATIC DI


PJ02
HEADPHONE JACK
LINE OUTPUT
PQ03
PY01 MECHA KEY BOARD
REMOTE JACK
TIMER SWITCH PU01
PHOT CUPLA
P071
REEL MOTOR
SKIP
BRAKE
CASSETTE
ANTI REC
PLAY
CAPSTAN MOTOR
AUTO RESET
QQ01
QQ02
QK01
QK02
TP01
TP02
TP03
TP04
TP05
TP06
QK01/QK02
SWITCHING
MULTIPLEXA
P002 KEY SW. AND L.E.D
AUTO
START
RESET
ON
READY
ERROR

Q071
HW10001030
SP1201

QE01
HC10040020
AN6558

QJ01
HC10017090
NJM2043DD

QJ02
HC10082050
TA7325P

QE21∼QE24
QJ03,QJ04,QJ09∼QJ12
QJ71∼QJ74,QU24
HT326342A1
2SC2634(R,S)

QJ07
HC10007090
NJM4560D

QJ75,QE25
QU05,QU18
HT107332A1
2SA733(P,Q)

QU01
HC10075030
LM6402A-075

QU02∼QU04
QU06,QU07
QU11,QU16,QU17
QU19,QU22,QU23
QU25,Q807,Q809
HT308282A1
2SC828(R,S)

QU08,QU09,QU14
QU15,Q821
HT313832C0
2SC1383(R,S)

QU10
HT40894000
2SD894

QU12,QU13
HT106832C0
2SA683(R,S)

QU21,Q801,Q802
Q804∼Q806,Q808
HT403131E0
2SD313(E)

Q803
HT205071E0
2SB507(E)

QK01,QK02
HC10052010
HA12020

QK13,QK14
HT326341S0
2SC2634(S)

QL01
HC10082050
TA7325P

QL03
HC10015270
LM324N

QL07,QL08
HW40001500
P1501

QL11,QL12
HT313841S0
2SC1384(S)

QL13∼QL19
QL51∼QL54
HT308282A1
2SC828(R,S)

QQ01
HC10101030
LC6502C

QQ02
HC736700A0
74LS367A

QQ03
HC10007090
NJM4558D

QQ04,QL02
HC10003090
NJM4558D

QQ05
HC10021370
MC3403N

QQ11,QQ12
HT326341T0
2SC2634(T)

QQ13∼QQ15
QK11,QK12
QK15∼QK20
HT326342A1
2SC2634(R,S)

QQ16∼QQ25
QQ27,QQ28,QQ30,QQ32
HT308282A1
2SC828(R,S)

QQ26
HT107332A0
2SA733(P,Q)

DE21,DE22
DX01∼DX04
DU01∼DU05,DU08
DU10,DU11,DU15,DU16
DU21∼DU23
HD20001000
1S1555 or 1S2473
or 1S2076 or DS448
or MA150

DU06,D804,D805
HD30024090
WZ120

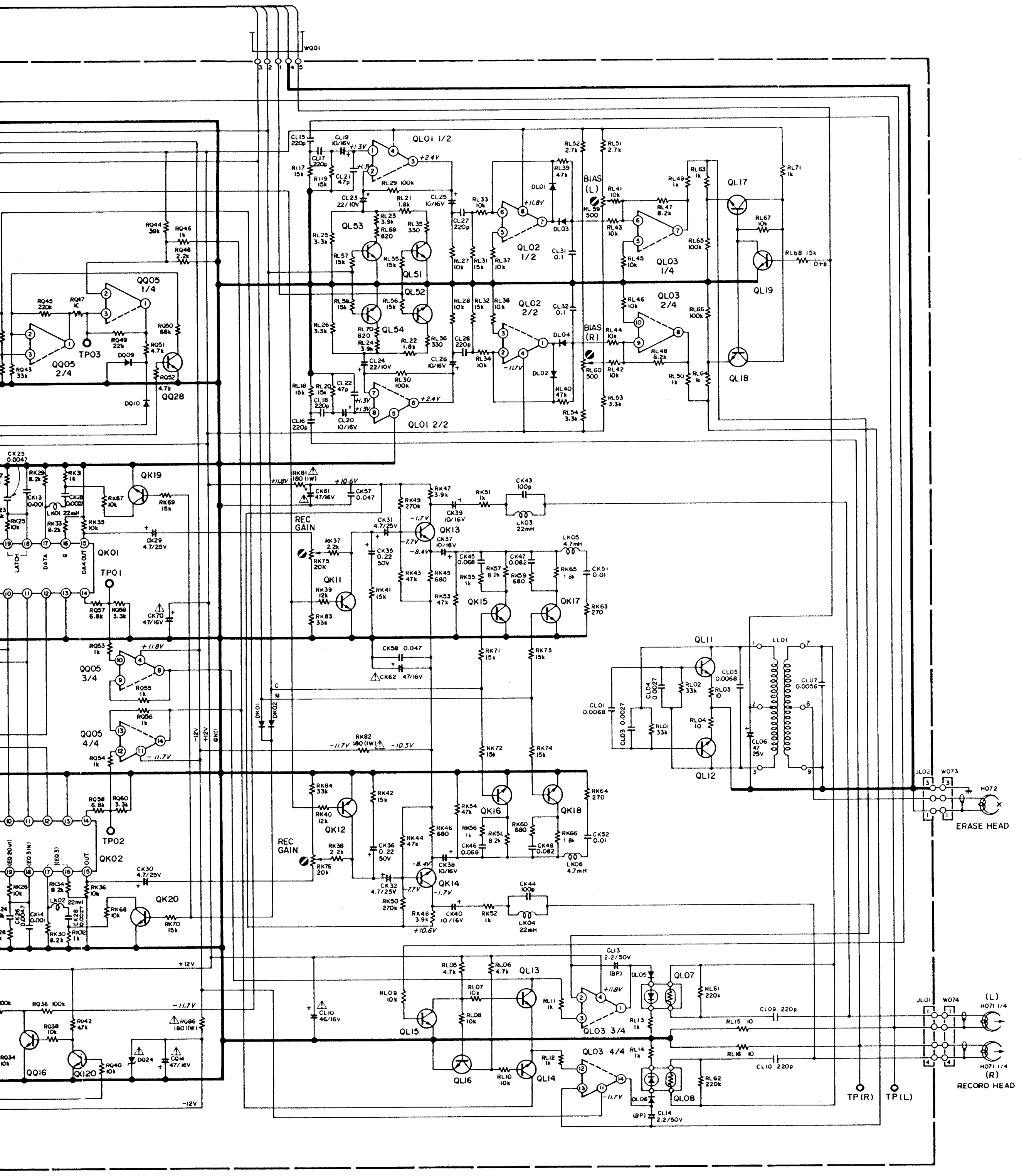
DU07,DU12∼DU14
HD20015032
DS135D

D801,D802
HD20027080
RB152

D803
HD30030090
WZ177

Components and wiring are subject to change for modification without notice.

EMATIC DIAGRAM FOR Model SD720


WQ01
QL01 1/2
QL01 2/2
QL02 1/2
QL02 2/2
QL03 1/4
QL03 2/4
QL03 3/4
QL03 4/4
BIAS (L)
BIAS (R)
QL17
QL18
QL19
QL51
QL52
QL53
QL54
QQ05 1/4
QQ05 2/4
QQ05 3/4
QQ05 4/4
TP03
TP01
TP02
QQ28
QK01
QK02
QK11
QK12
QK13
QK14
QK15
QK16
QK17
QK18
QK19
QK20
REC GAIN
REC GAIN
QL11
QL12
LL01
JL02
WO73
H072
ERASE HEAD
JL01
WO74
(L)
H071 1/4
(R)
H071 1/4
RECORD HEAD
TP(R)
TP(L)
QL13
QL14
QL15
QL16
QL07
QL08
QQ16
QQ120
+12V
-12V
-11.7V

,QL02
03090
558D

21370
03N

QI2
341T0
534(T)

∼QQ15
QK12
∼QK20
342A1
534(R,S)

∼QQ25
QQ28,QQ30,QQ32
8282A1
28(R,S)

332A0
33(P,Q)

DE21,DE22
DX01∼DX04
DU01∼DU05,DU08
DU10,DU11,DU15,DU16
DU21∼DU23
HD20001000
1S1555 or 1S2473
or 1S2076 or DS448
or MA150

DU06,D804,D805
HD30024090
WZ120

DU07,DU12∼DU14
HD20015032
DS135D

D801,D802
HD20027080
RB152

D803
HD30030090
WZ177

D806
HD30025090
WZ150

D807,D808
HD30035090
WZ061

D809
HD30095090
WZ034

D810
HD30072090
WZ100

D821
HD30021020
MA1068M

DY01 ∼ DY03
Hi10035020
LN38GP

DY04
Hi10036020
LN48YP

QY05,QY06
Hi10022020
LN28RP

DY11∼DY15
Hi10031020
LN324GP

DL01∼DL06
HD20001000
1S1555 or 1S2473
or 1S2076 or DS448
or MA150

DQ01
HD30035010
HZ2B1

DQ02,DQ03
HD30076090
WZ038

DQ04∼DQ15
DQ17,DQ18,DQ22,DQ23
DK01,DK02
HD20001000
1S1555 or 1S2473
or 1S2076 or DS448
or MA150

DQ16,DQ19,DQ20
HD10004020
OA91

DQ21
HD30052090
WZ056

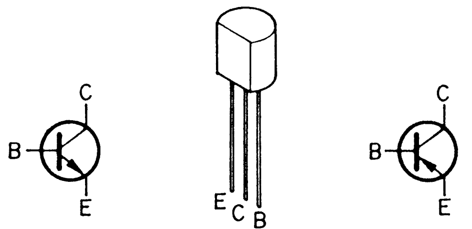
DQ24,DQ25
HD30029090
WZ090

DQ92,DQ93
Hi10037020
LN322GP

DQ94
Hi10025020
LN222RP

QQ29
HT32062IC0
2SC2062(C)

QQ31
HC401100B0
HD14011BP

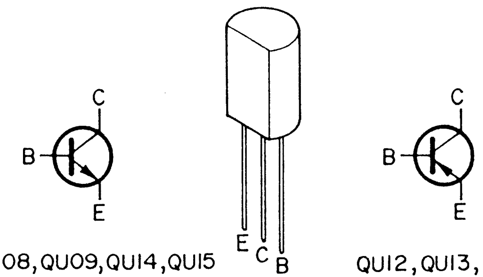


QE21∿QE24,QJ03,QJ04
QJ09∿QJ12,QJ71∿QJ74
QU24,QK13,QK14,QQ12,QQ11
QQ13∿QQ15,QK11,QK12
QK15∿QK20,Q651∿Q653
Q611∿Q614,QS52,QS54
(2SC2634)

QU02∿QU04,QU06,QU07
QU11,QU16,QU17,QU19,QU22
QU23,QU25,Q807,Q809
QL13∿QL19,QL51∿QL54
QQ16∿QQ25,QQ27,QQ28
QQ30,QQ32
(2SC828)

QJ75,QE25,QU05
QU18,QQ26
QS51,QS53
(2SA733)

QQ29
(2SC2062)

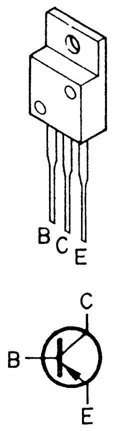


QU08,QU09,QU14,QU15
Q821,QS81
(2SC1383)

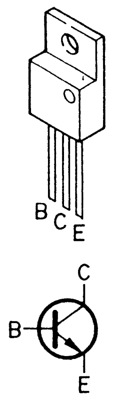
QU10 (2SD894)

QL11,QL12 (2SC1384)

QU12,QU13,QS82
(2SA683)

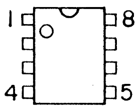


Q803 (2SB507)



QU21,Q801,Q802
Q804∿Q806,Q808
(2SD313)

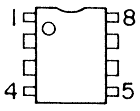
TOP VIEW



QE01,Q954

(AN6558)

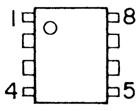
TOP VIEW



QJ01

(NJM2043DD)

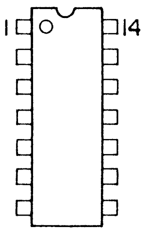
TOP VIEW



QQ03,QQ04
QL02,Q906
Q907,Q955
(NJM4558D)

QJ07
(NJM4560D)

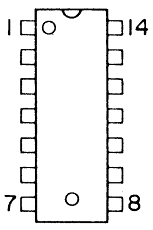
TOP VIEW



QS01,QS02,QS04

(LC4066B)

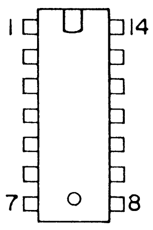
TOP VIEW



QL03

(LM324N)

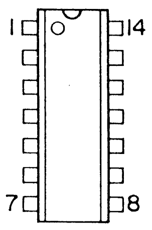
TOP VIEW



QQ05

(MC3403N)

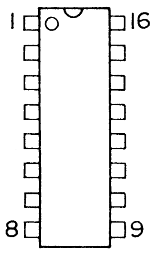
TOP VIEW



QQ31

(HD14011BP)

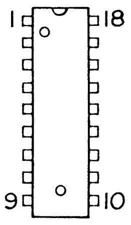
TOP VIEW



QQ02

(74LS367A)

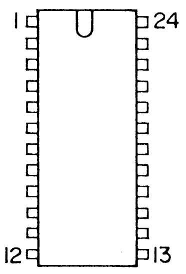
TOP VIEW



Q601,Q602

(NE652)

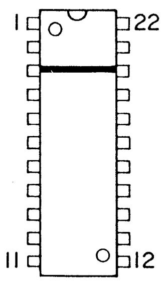
TOP VIEW



Q603,Q604

(NE654)

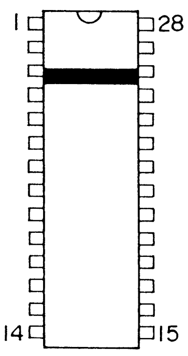
TOP VIEW



Q905,Q953

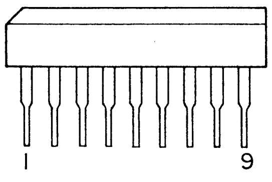
(AN6291)

TOP VIEW



QK01,QK02
(HA12020)

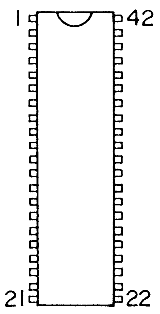
SIDE VIEW



QJ01,QL01

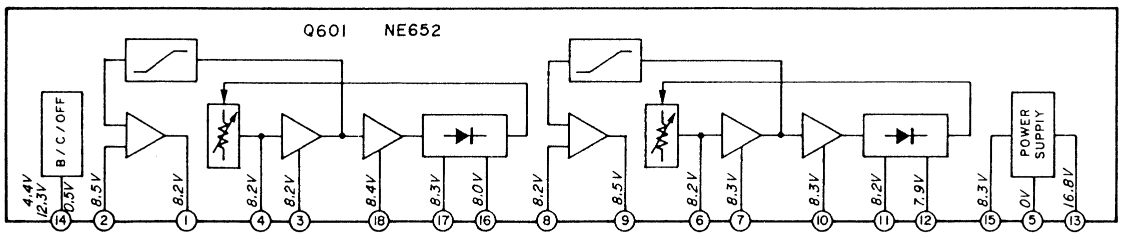
(TA7325P)

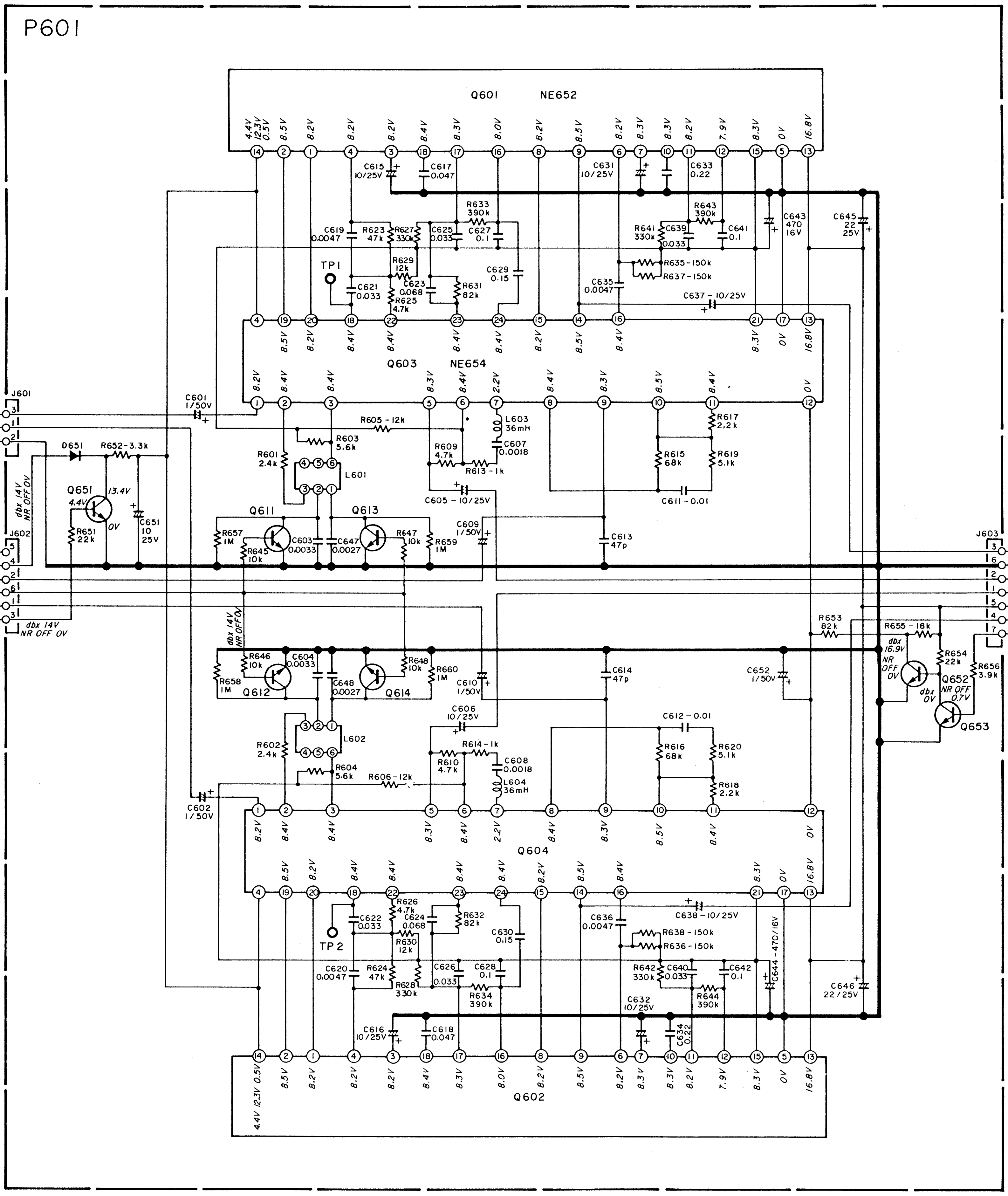
TOP VIEW



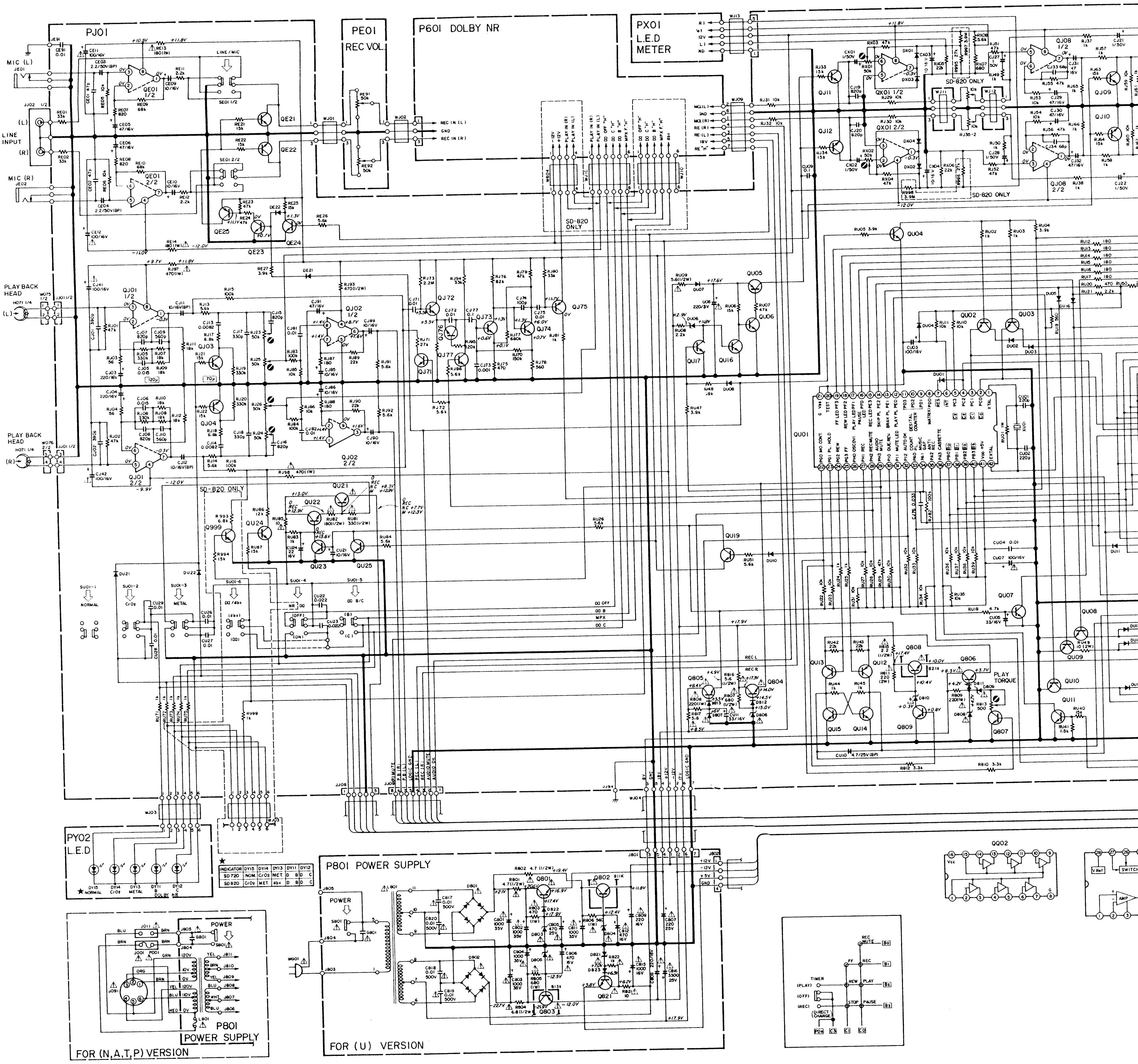
QU01
(LM6402A-075)
QQ01
(LC6502C)

Q601, Q602	Q603, Q604	Q651 ~ Q653, Q611 ~ Q614	D651
HC10012270	HC10013270	HT326342A1	HD20001000
NE652	NE654	2SC2634 R,S	DIODE


Q601 NE652
B/C/OFF
POWER SUPPLY
4.4V 12.3V 0.5V
8.5V
8.2V
8.2V
8.2V
8.4V
8.3V
8.0V
8.2V
8.5V
8.2V
8.3V
8.3V
8.2V
7.9V
8.3V
0V
16.8V
14 2 1 4 3 18 17 16 8 9 6 7 10 11 12 15 5 13


P601
Q601 NE652
Q603 NE654
Q604
Q602
(SD720 WJ02)
J601
REC (L) IN
REC (R) IN
GND
(SD720 WJ10)
J602
DQ B 'H'
DQ C 'H'
PB (L) IN
MPX 'H'
PB (R) IN
DQ OFF 'H'
dbx 14V NR OFF 0V
(SD720 WJ09)
J603
REC OUT (L)
GND
MONITOR OUT (L)
MONITOR OUT (R)
Vcc 16.9V
REC OUT (R)
REC 'H'
REC 4.2V PLAY 0V
D651
R652-3.3k
Q651
4.4V
13.4V
0V
R651 22k
C651 10 25V
C601 1/50V
C602 1/50V
TP1
TP2
Q611
Q612
Q613
Q614
Q652
Q653
L601
L602
L603 36mH
L604 36mH
R601 2.4k
R602 2.4k
R603 5.6k
R604 5.6k
R605-12k
R606-12k
R609 4.7k
R610 4.7k
R613-1k
R614-1k
R615 68k
R616 68k
R617 2.2k
R618 2.2k
R619 5.1k
R620 5.1k
R623 47k
R624 47k
R625 4.7k
R626 4.7k
R627 330k
R628 330k
R629 12k
R630 12k
R631 82k
R632 82k
R633 390k
R634 390k
R635-150k
R636-150k
R637-150k
R638-150k
R641 330k
R642 330k
R643 390k
R644 390k
R645 10k
R646 10k
R647 10k
R648 10k
R653 82k
R654 22k
R655-18k
R656 3.9k
R657 1M
R658 1M
R659 1M
R660 1M
C603 0.0033
C604 0.0033
C605-10/25V
C606 10/25V
C607 0.0018
C608 0.0018
C609 1/50V
C610 1/50V
C611-0.01
C612-0.01
C613 47p
C614 47p
C615 10/25V
C616 10/25V
C617 0.047
C618 0.047
C619 0.0047
C620 0.0047
C621 0.033
C622 0.033
C623 0.068
C624 0.068
C625 0.033
C626 0.033
C627 0.1
C628 0.1
C629 0.15
C630 0.15
C631 10/25V
C632 10/25V
C633 0.22
C634 0.22
C635 0.0047
C636 0.0047
C637-10/25V
C638-10/25V
C639 0.033
C640 0.033
C641 0.1
C642 0.1
C643 470 16V
C644-470/16V
C645 22 25V
C646 22/25V
C647 0.0027
C648 0.0027
C652 1/50V
dbx 16.9V NR OFF 0V
dbx 0V NR OFF 0.7V

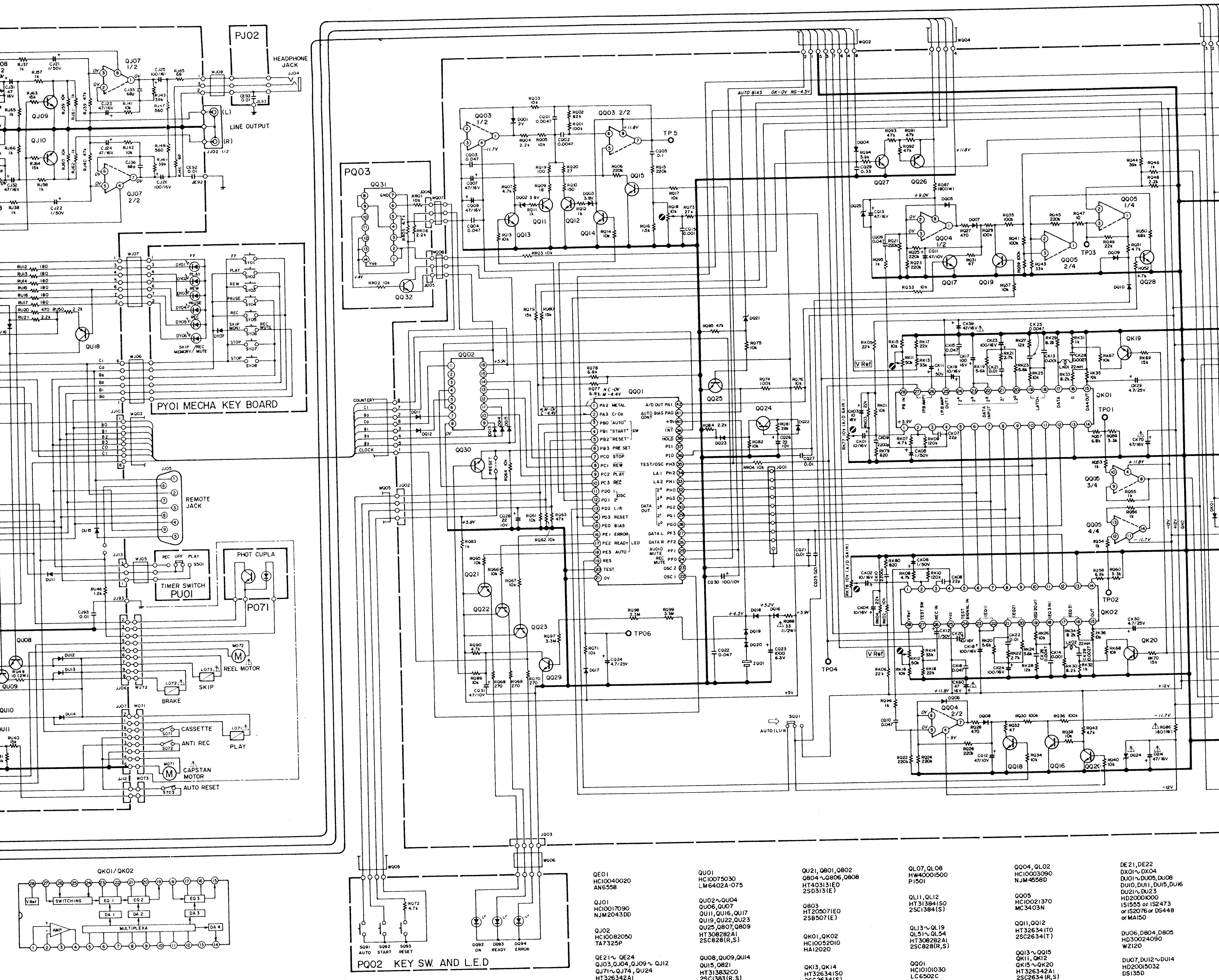
marantz®


PJ01
PE01
REC VOL
P601 DOLBY NR
PX01
L.E.D
METER
MIC (L)
LINE INPUT
(L)
(R)
MIC (R)
LINE / MIC
PLAY BACK HEAD
SD-820 ONLY
SD-820 ONLY
QU01
PLAY TORQUE
PY02
L.E.D
P801 POWER SUPPLY
POWER
FOR (U) VERSION
P801
POWER SUPPLY
FOR (N,A,T,P) VERSION
QQ02

NOTE ON SAFETY:

Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

SCHEMATIC DIAGRA


PJ02
HEADPHONE JACK
LINE OUTPUT
PQ03
PY01 MECHA KEY BOARD
REMOTE JACK
TIMER SWITCH
PU01
PHOT CUPLA
P071
REEL MOTOR
SKIP
BRAKE
CASSETTE
ANTI REC
PLAY
CAPSTAN MOTOR
AUTO RESET
QQ01
QQ02
QK01
QK02
TP01
TP02
TP03
TP04
TP5
TP06
V Ref
AUTO BIAS
QK01/QK02
SWITCHING
EQ 1
EQ 2
EQ 3
DA 1
DA 2
DA 3
DA 4
AMP
MULTIPLEXA
PQ02 KEY SW. AND L.E.D
SQ91 AUTO
SQ92 START
SQ93 RESET
DQ92 ON
DQ93 READY
DQ94 ERROR

Q071
HW10001030
SP1201

QE01
HC10040020
AN6558

QJ01
HC10017090
NJM2043DD

QJ02
HC10082050
TA7325P

QE21∿QE24
QJ03,QJ04,QJ09∿QJ12
QJ71∿QJ74,QU24
HT326342A1
2SC2634(R,S)

QJ07
HC10007090
NJM4560D

QJ75,QE25
QU05,QU18
HT107332A1
2SA733(P,Q)

QU01
HC10075030
LM6402A-075

QU02∿QU04
QU06,QU07
QU11,QU16,QU17
QU19,QU22,QU23
QU25,Q807,Q809
HT308282A1
2SC828(R,S)

QU08,QU09,QU14
QU15,Q821
HT313832C0
2SC1383(R,S)

QU10
HT40894000
2SD894

QU12,QU13
HT106832C0
2SA683(R,S)

QU21,Q801,Q802
Q804∿Q806,Q808
HT403131E0
2SD313(E)

Q803
HT205071E0
2SB507(E)

QK01,QK02
HC10052010
HA12020

QK13,QK14
HT326341S0
2SC2634(S)

QL01
HC10082050
TA7325P

QL03
HC10015270
LM324N

QL07,QL08
HW40001500
P1501

QL11,QL12
HT313841S0
2SC1384(S)

QL13∿QL19
QL51∿QL54
HT308282A1
2SC828(R,S)

QQ01
HC10101030
LC6502C

QQ02
HC736700A0
74LS367A

QQ03
HC10007090
NJM4558D

QQ04,QL02
HC10003090
NJM4558D

QQ05
HC10021370
MC3403N

QQ11,QQ12
HT326341T0
2SC2634(T)

QQ13∿QQ15
QK11,QK12
QK15∿QK20
HT326342A1
2SC2634(R,S)

QQ16∿QQ25
QQ27,QQ28,QQ30,QQ32
HT308282A1
2SC828(R,S)

QQ26
HT107332A0
2SA733(P,Q)

DE21,DE22
DX01∿DX04
DU01∿DU05,DU08
DU10,DU11,DU15,DU16
DU21∿DU23
HD20001000
1S1555 or 1S2473
or 1S2076 or DS448
or MA150

DU06,D804,D805
HD30024090
WZ120

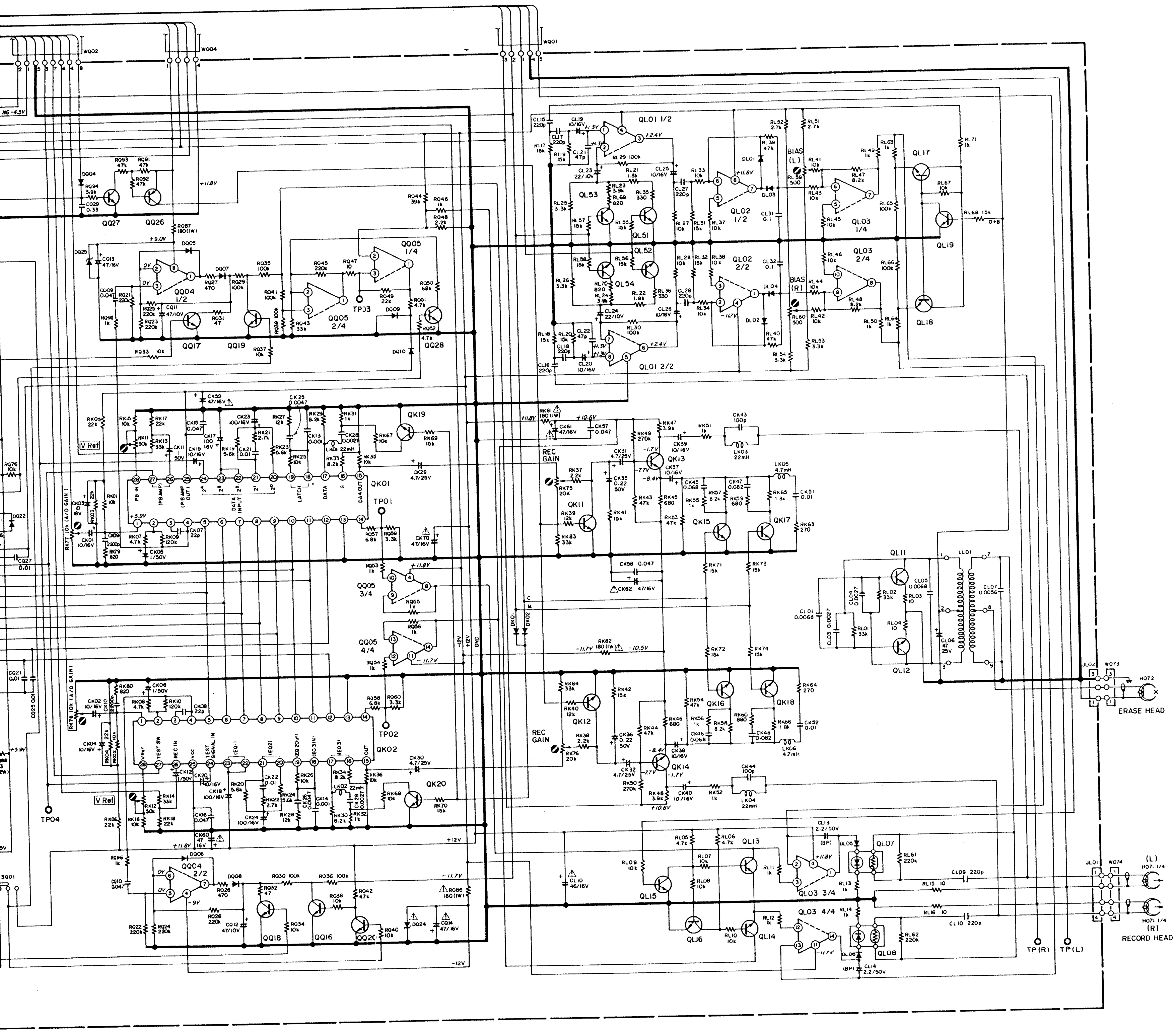
DU07,DU12∿DU14
HD20015032
DS135D

D801,D802
HD20027080
RB152

D803
HD30030090
WZ177

Components and wiring are subject to change for modification without notice.

SCHEMATIC DIAGRAM FOR Model SD820dbx


WQ01
WQ02
WQ04
QL01 1/2
QL01 2/2
QL02 1/2
QL02 2/2
QL03 1/4
QL03 2/4
QL03 3/4
QL03 4/4
BIAS (L)
BIAS (R)
QQ04 1/2
QQ04 2/2
QQ05 1/4
QQ05 2/4
QQ05 3/4
QQ05 4/4
QK01
QK02
REC GAIN
V Ref
TP01
TP02
TP03
TP04
TP(R)
TP(L)
ERASE HEAD
RECORD HEAD
(L)
(R)
+11.8V
-11.7V
+12V
-12V

QU21, Q801, Q802
Q804 ~ Q806, Q808
HT403131E0
2SD313(E)

Q803
HT205071E0
2SB507(E)

QK01, QK02
HC10052010
HA12020

QK13, QK14
HT326341S0
2SC2634(S)

QL01
HC10082050
TA7325P

QL03
HC10015270
LM324N

QL07, QL08
HW40001500
P1501

QL11, QL12
HT313841S0
2SC1384(S)

QL13 ~ QL19
QL51 ~ QL54
HT308282A1
2SC828(R,S)

QQ01
HC10101030
LC6502C

QQ02
HC736700A0
74LS367A

QQ03
HC10007090
NJM4558D

QQ04, QL02
HC10003090
NJM4558D

QQ05
HC10021370
MC3403N

QQ11, QQ12
HT326341T0
2SC2634(T)

QQ13 ~ QQ15
QK11, QK12
QK15 ~ QK20
HT326342A1
2SC2634(R,S)

QQ16 ~ QQ25
QQ27, QQ28, QQ30, QQ32
HT308282A1
2SC828(R,S)

QQ26
HT107332A0
2SA733(P,Q)

DE21, DE22
DX01 ~ DX04
DU01 ~ DU05, DU08
DU10, DU11, DU15, DU16
DU21 ~ DU23
HD20001000
1S1555 or 1S2473
or 1S2076 or DS448
or MA150

DU06, D804, D805
HD30024090
WZ120

DU07, DU12 ~ DU14
HD20015032
DS135D

D801, D802
HD20027080
RB152

D803
HD30030090
WZ177

D806
HD30025090
WZ150

D807, D808
HD30035090
WZ061

D809
HD30095090
WZ034

D810
HD30072090
WZ100

D821
HD30021020
MA1068M

DY01 ~ DY03
Hi10035020
LN38GP

DY04
Hi10036020
LN48YP

QY05, QY06
Hi10022020
LN28RP

DY11 ~ DY15
Hi10031020
LN324GP

DL01 ~ DL06
HD20001000
1S1555 or 1S2473
or 1S2076 or DS448
or MA150

DQ01
HD30035010
HZ2B1

DQ02, DQ03
HD30076090
WZ038

DQ04 ~ DQ15
DQ17, DQ18, DQ22, DQ23
DK01, DK02
HD20001000
1S1555 or 1S2473
or 1S2076 or DS448
or MA150

DQ16, DQ19, DQ20
HD10004020
0A91

DQ21
HD30052090
WZ056

DQ24, DQ25
HD30029090
WZ090

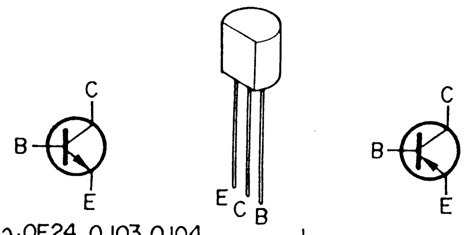
DQ92, DQ93
Hi10037020
LN322GP

DQ94
Hi10025020
LN222RP

QQ29
HT32062IC0
2SC2062(C)

QQ31
HC40110080
HD14011BP

notice.

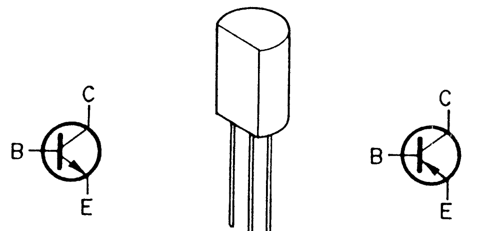


QE21∼QE24,QJ03,QJ04
QJ09∼QJ12,QJ71∼QJ74
QU24,QK13,QK14,QQ12,QQ11
QQ13∼QQ15,QK11,QK12
QK15∼QK20,Q651∼Q653
Q611∼Q614,QS52,QS54
(2SC2634)

QU02∼QU04,QU06,QU07
QU11,QU16,QU17,QU19,QU22
QU23,QU25,Q807,Q809
QL13∼QL19,QL51∼QL54
QQ16∼QQ25,QQ27,QQ28
QQ30,QQ32
(2SC828)

QJ75,QE25,QU05
QU18,QQ26
QS51,QS53
(2SA733)

QQ29
(2SC2062)

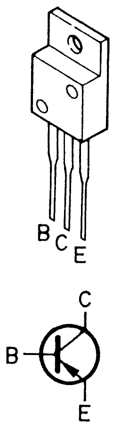


QU08,QU09,QU14,QU15
Q821,QS81
(2SC1383)

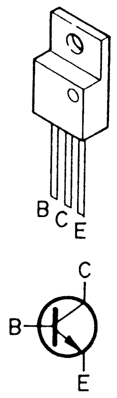
QU10 (2SD894)

QL11,QL12 (2SC1384)

QU12,QU13,QS82
(2SA683)

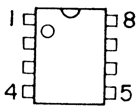


Q803 (2SB507)



QU21,Q801,Q802
Q804∼Q806,Q808
(2SD313)

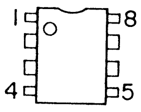
TOP VIEW



QE01,Q954

(AN6558)

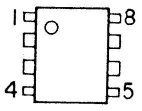
TOP VIEW



QJ01

(NJM2043DD)

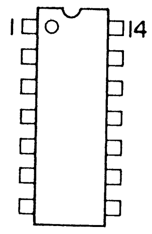
TOP VIEW



QQ03,QQ04
QL02,Q906
Q907,Q955
(NJM4558D)

QJ07
(NJM4560D)

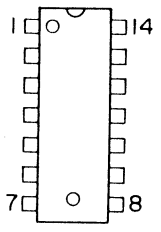
TOP VIEW



QS01,QS02,QS04

(LC4066B)

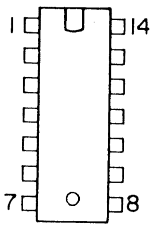
TOP VIEW



QL03

(LM324N)

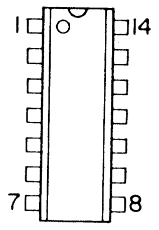
TOP VIEW



QQ05

(MC3403N)

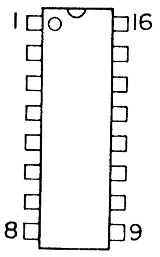
TOP VIEW



QQ31

(HD14011BP)

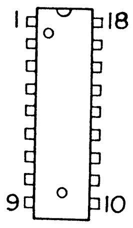
TOP VIEW



QQ02

(74LS367A)

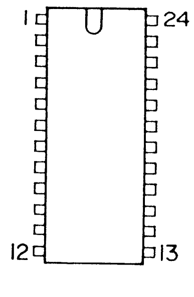
TOP VIEW



Q601,Q602

(NE652)

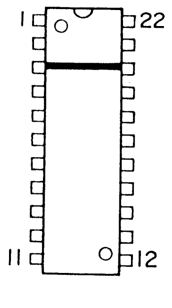
TOP VIEW



Q603,Q604

(NE654)

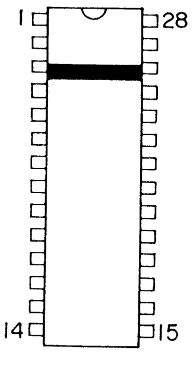
TOP VIEW



Q905,Q953

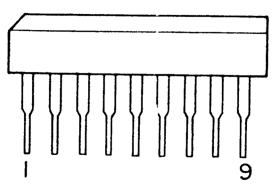
(AN6291)

TOP VIEW



QK01,QK02
(HA12020)

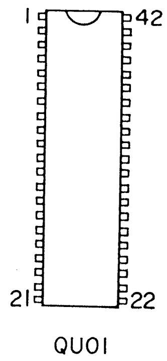
SIDE VIEW



QJ01,QL01

(TA7325P)

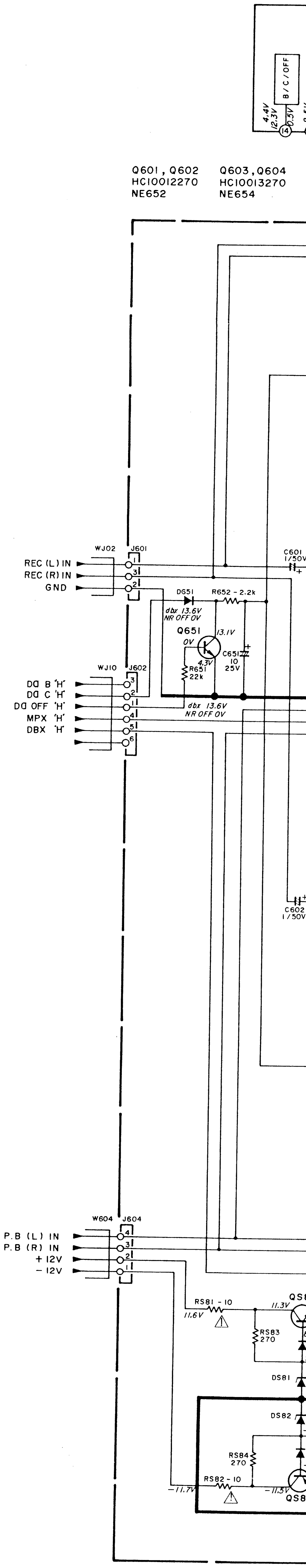
TOP VIEW



QU01
(LM6402A-075)
QQ01
(LC6502C)

Q601, Q602
HC10012270
NE652

Q603, Q604
HC10013270
NE654



B/C/OFF
4.4V
12.3V
0.5V
14
WJ02
J601
REC (L) IN
REC (R) IN
GND
C601
1/50V
D651
R652 - 2.2k
dbx 13.6V
NR OFF 0V
Q651
13.1V
0V
4.3V
R651
22k
C651
10
25V
WJ10
J602
DQ B 'H'
DQ C 'H'
DQ OFF 'H'
MPX 'H'
DBX 'H'
dbx 13.6V
NR OFF 0V
C602
1/50V
W604
J604
P.B (L) IN
P.B (R) IN
+ 12V
− 12V
RS81 - 10
11.6V
11.3V
RS83
270
DS81
DS82
RS84
270
RS82 - 10
−11.7V
−11.5V

152

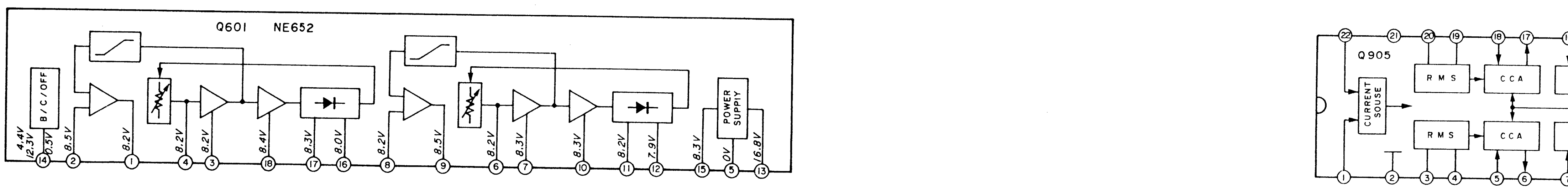
X

Q601, Q602
HC10012270
NE652

Q603, Q604
HC10013270
NE654

Q651～Q653, Q611～Q614
HT326342A1
2SC2634 R,S

D651
HD20001000
DIODE



Q601 NE652
B/C/OFF
POWER SUPPLY
Q905
CURRENT SOUSE
RMS
CCA

603,Q604
C10013270
E654

Q651,Q652,Q653,Q611～Q614
HT326342A1
2SC2634 R,S

D651
HD20001000
DIODE

Q954
HC10039020
AN6558

Q905,Q953
HC10039020
AN6291 dbx

Q906,Q907,Q955
HC10003090
4558D

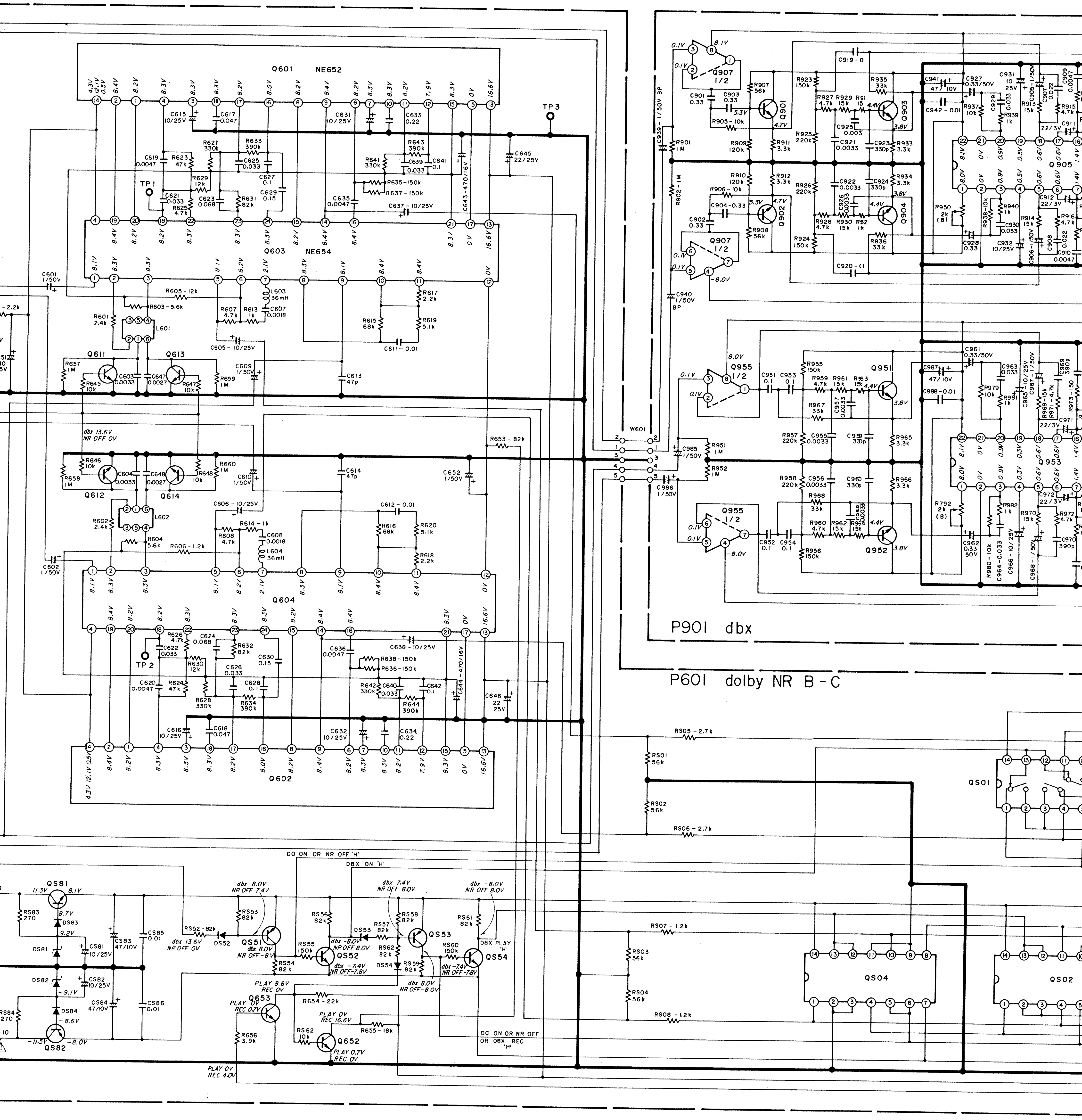
QS01～QS04
HC406600B0
QUAD BILATERAL SW.

Q901～Q904,Q951,Q952
HT326342A1
2SC2634 R,S

QS51,QS53
HT107332B0
2SA733 Q,R

Q52,QS54
H326342A1
2C2634 R,S

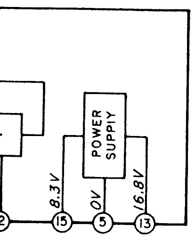
QS81
HT313832C0
2SC1383 R,S

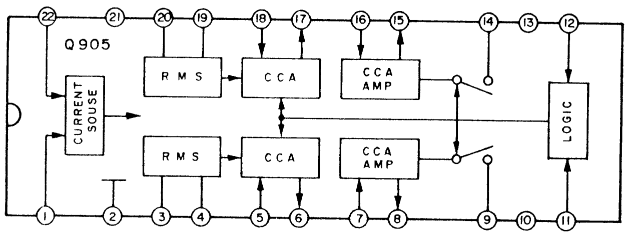


Q601 NE652
Q603 NE654
Q604
Q602
TP1
TP2
TP3
Q611
Q612
Q613
Q614
L601
L602
L603 36mH
L604 36mH
W601
Q901
Q902
Q903
Q904
Q905
Q907 1/2
Q951
Q952
Q953
Q955 1/2
P901 dbx
P601 dolby NR B-C
QS01
QS02
QS04
QS51
QS52
QS53
QS54
QS81
QS82
Q652
Q653
DS81
DS82
DS83
DS84
DS52
DS53
DS54
DQ ON OR NR OFF 'H'
DBX ON 'H'
DQ ON OR NR OFF OR DBX REC 'H'
DBX PLAY 'H'
dbx 13.6V NR OFF 0V
PLAY 8.6V REC 0V
PLAY 0V REC 0.7V
PLAY 0V REC 16.6V
PLAY 0.7V REC 0V
PLAY 0V REC 4.0V

152

651
D20001000
IODE


POWER SUPPLY
8.3V
0V
16.8V
15
5
13


Q905
RMS
CCA
CCA AMP
CURRENT SOUSE
LOGIC

,Q907,Q955
03090
)

QS01 ~ QS04
HC406600B0
QUAD BILATERAL SW.

Q901 ~ Q904,Q951,Q952
HT326342A1
2SC2634 R,S

QS51,QS53
HT107332B0
2SA733 Q,R

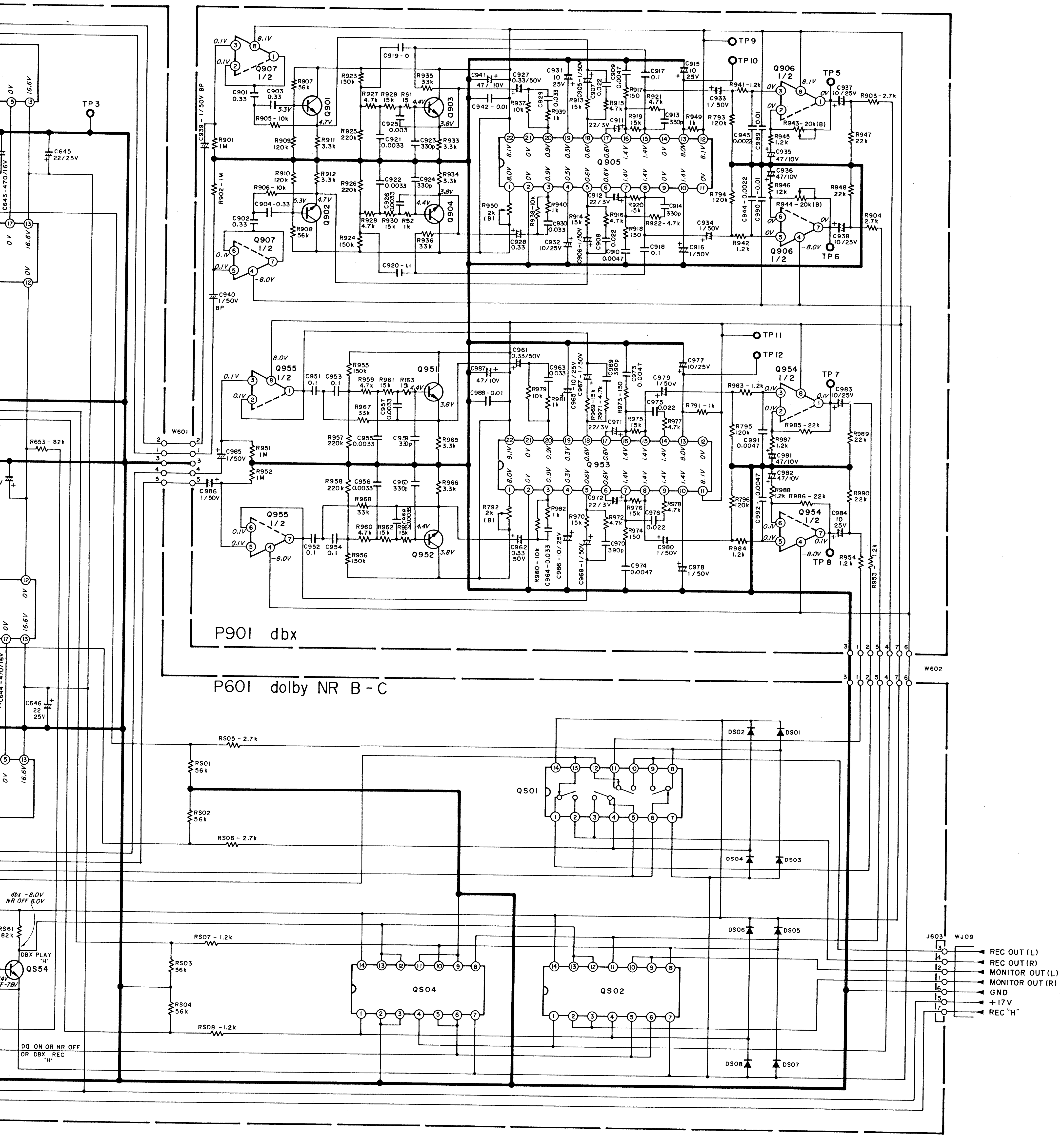
Q52,QS54
H326342A1
2C2634 R,S

QS81
HT313832C0
2SC1383 R,S

QS82
HT106832C0
2SA683 R,S

DS01 ~ DS08,DS52 ~ DS54
HD2001000
DIODE

DS81,DS82
HD30029090
WZ-090


TP3
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12
Q901
Q902
Q903
Q904
Q905
Q906 1/2
Q907 1/2
Q951
Q952
Q953
Q954 1/2
Q955 1/2
W601
W602
P901 dbx
P601 dolby NR B-C
QS01
QS02
QS04
QS54
DS01
DS02
DS03
DS04
DS05
DS06
DS07
DS08
RS01 56k
RS02 56k
RS03 56k
RS04 56k
RS05 - 2.7k
RS06 - 2.7k
RS07 - 1.2k
RS08 - 1.2k
RS61 82k
R653 - 82k
C645 22/25V
C646 22 25V
dbx -8.0V
NR OFF 8.0V
DBX PLAY 'H'
DG ON OR NR OFF
OR DBX REC 'H'
J603
WJ09
REC OUT (L)
REC OUT (R)
MONITOR OUT (L)
MONITOR OUT (R)
GND
+17V
REC"H"